Evaluation Report of NIH K-12 Program

Title: Evaluation Report for the NIH6 Curriculum Supplement: *Looking Good, Feeling Good: From the Inside Out*

Date: 2004

Description:
This report evaluates one component within the NIH K-12 program, the NIH Curriculum Supplements. The NIH Curriculum Supplements are K-12 teacher's guides to two weeks' of lessons that explore the science behind current health topics. The modules are sent free of charge upon request to educators across the United States. Over 50,000 educators have one or more curriculum supplement.

This study specifically examines the results of the field tests conducted during the development of:

Looking Good, Feeling Good: From the Inside Out (Grades 7 – 8)

This study was designed to determine the effectiveness of the module as a supplementary addition in the K-12 science curriculum. The field test sites were selected from volunteers who were chosen to maximize inclusion of various races, ethnicities, and geographic regions. The evaluation consisted of a field test with close-to-complete instructional materials. The surveys measured student knowledge using a pre/post test. The teachers also commented on the effectiveness of the lessons and their implementation. These resulted were used to identify strengths that were highlighted and weaknesses that were corrected in the final draft. The teachers' comments were included in the final draft as "tips from teachers" on specific lessons.

Final Evaluation Report
for the

NIH6 Curriculum Supplement:
Looking Good, Feeling Good: From the Inside Out

BSCS Evaluation Report (ER 2004-6 April)

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Executive Summary

BSCS developed a learning module on "Looking Good, Feeling Good: From the Inside Out" funded by a grant from the National Institutes of Health. The evaluation study was designed to determine its effectiveness as supplementary material for middle school instructional materials. The field test sites were selected from volunteers who were chosen to maximize inclusion of different races, ethnicities, geographic regions, and urban-suburban-rural schools.

There were 8 primary and secondary sites in the study. The primary site teachers received a field test orientation at BSCS and an honorarium to be in the study. Secondary site teachers received no orientation, but were given a small honorarium upon completion of the materials and evaluation. There were 7 primary site teachers and 388 primary site students in the study. There was 1 secondary site teacher and 21 secondary site students in the study. Missing materials (e.g., posttests) reduced the number (n) for some analyses.

The evaluation consisted of a field test with close-to-complete instructional materials. Students and teachers completed evaluation questionnaires after using the materials in February and March, 2004. Tables 6-12 are brief "Evaluation Snapshots" of each lesson and are good starting points for developers. Results and comments on each of the seven lessons are located in section 2 of the report. The developers are urged to review the tables and comments and to sample their diversity and depth in order to identify possible areas for revision.

The Pretest-Posttest Evaluation consisted of results from the administration of Student Knowledge Surveys. Before using the materials the students took a Student Knowledge Survey and then the same survey was given again after completing the materials. The t-test results suggest statistically significant differences in the increases from pretest to posttest scores when all schools are combined. In addition, the teachers responded to questions about the success of the materials in achieving the learning outcomes. These results indicated high agreement with statements on the effectiveness of the module in achieving the established learning outcomes for each lesson. A response category of “Not Sure” which was available to students to indicate uncertainty for the question was also examined and yielded a substantial reduction in frequency from pretest to posttest knowledge surveys.

The final sections briefly discuss the results and recommendations for the developers. General comments included:

- **Lesson 6 needs revision.**
- **Lesson 3 rated the highest overall.**
- **Reading levels were appropriate for the age group.**
- **The difficulty levels were appropriate for the age group.**
- **The internet activities and the SunCheck timer were particularly interesting for the students.**
- **There was a substantial reduction of “not sure” answers from the pretest to the posttest.**
- **There was a substantial increase in correct answers from the pretest to the posttest.**

Background Information on the Project

Background and Goals of the Program

"Looking Good, Feeling Good" is created with funding from the National Institute of Arthritis and Musculoskeletal and Skin Disease (NAIMS) and the Office of Science Education (OSE) at NIH. It is the sixth in a series of contracts funded by NIH and developed by BSCS.

The final product will be an instructional module composed of seven lessons designed to be taught in sequence over approximately one week. It is intended to be a replacement for part of a standard curriculum in middle school. The final product is a print module that includes inquiry-based activities and supporting materials for the teacher, web activities which complement the module, and a plan for distribution and implementation of the completed modules.

The module is designed to accomplish the following:

- **Provide students with an opportunity to apply creative and critical-thinking skills as a way of discovering solutions to a wide range of problems;**
- **Deepen students' understanding of the importance of basic research to advances in medical and health sciences;**
- **Show students the direct and indirect benefits of scientific discoveries on their health and the health of their friends and families;**
- **Provoke student interest in medical topics;**
- **Help teachers accomplish their educational goals of improving the quality of science education;**
- **Develop curriculum that is sensitive to the needs of teachers with diverse student populations in classrooms across the nation;**
- **Support the implementation of the National Science Education Standards; and**
- **Promote the visibility and missions of individual institutes and centers and the NIH**

The Curriculum Development Process.

BSCS uses a curriculum development process that involves an advisory board, an external design team, and an internal writing team. In the Initial Phase, an Advisory Board meeting of experts in the field is convened at the beginning of the development process to identify the key or critical areas of study in the field as well as the key concepts to be conveyed in the materials. Resources are also sought from the Advisory Board.

Next, in the Content Review Phase, an external design team of subject matter experts and teachers at the appropriate grade level is brought together for several days of brainstorming and writing. This team, with the input of the Advisory Board, designs the activities and addresses options for structuring the materials.

The Materials Development Phase is next. After input is gained from the Advisory Board and the external Design Team, the BSCS curriculum developers begin the serious task of putting structure and form to the materials and various activities.

The Field Test Phase follows and the materials are tested with a national sample. The Evaluation Phase consists of analyzing and reporting the results of the Field Test. These evaluation results are used in revisions to the materials, sometimes minor, sometimes major. At this point there is a second Advisory Board meeting where the evaluation materials are studied and changes are made. This is followed by the Final Production and Distribution Phase in which the final copies of the materials are generated and disseminated.

The Instructional Materials in the Module

The final product is suitable for use with any middle school biology program. There are seven lessons:

1. It's Alive! Or Is It?
2. What Makes Bones Strong?
3. Anatomy of a Kick
4. Helping the Body to Build Strong Bones
5. Use It or Lose It
6. Shining the Light on Skin
7. Decisions Today for a Healthy Tomorrow

Each lesson contains readings and activities. There is a website for lessons three and six. Additionally, there are Teacher Background Materials to increase the ability of the teachers to use the materials effectively in the classroom.

The materials are designed to incorporate an inquiry-based approach, the 5E model: Engage, Explore, Explain, Elaborate, and Evaluate (Bybee, 1997).

Teachers, Students, and Test Sites

Primary Field Test Teachers.

Field test teachers were recruited by several methods, including an advertisement placed at the BSCS website, letters of invitation to teachers who had participated in previous BSCS field tests, a notice in the BSCS news magazine, and an ad in the National Science Teachers Association newsletter. We asked interested teachers to complete a teacher background survey to determine their level of interest and commitment and whether they would be teaching appropriate classes during the test period. The background surveys were reviewed by the project director, who selected the participants, and then contacted the teachers to see if they still wanted to participate in the study. Additionally, one teacher was chosen by the Office of Science Education from the Washington DC area. Even though by using volunteers we would never have a truly representative sample of schools or school districts, the staff made a concerted attempt to assure inclusion of a diverse population in the selection process by selecting schools that had diverse student populations and represented a variety of economic and geographic areas.

In February, 2004, the eight primary teachers were brought to BSCS for a 2-day Field Test Orientation. During the orientation the staff introduced the teachers to the key features of the science content and specific activities of the module. The project supported all travel expenses and the participants received an honorarium of $300.00. Upon completion of the module and receipt of the evaluation materials by BSCS the teachers received an additional honorarium of $300.00.

Secondary Field Test Teachers.

There was one additional teacher who wanted to participate in the field test however; resources were not available to accommodate her. In this case the materials were sent directly to her and asked that she use them according to the guidelines in the Teacher Background Materials. This teacher received a $100.00 honorarium upon completion of the module and receipt of the evaluation materials by BSCS.

Students in the Field Test.

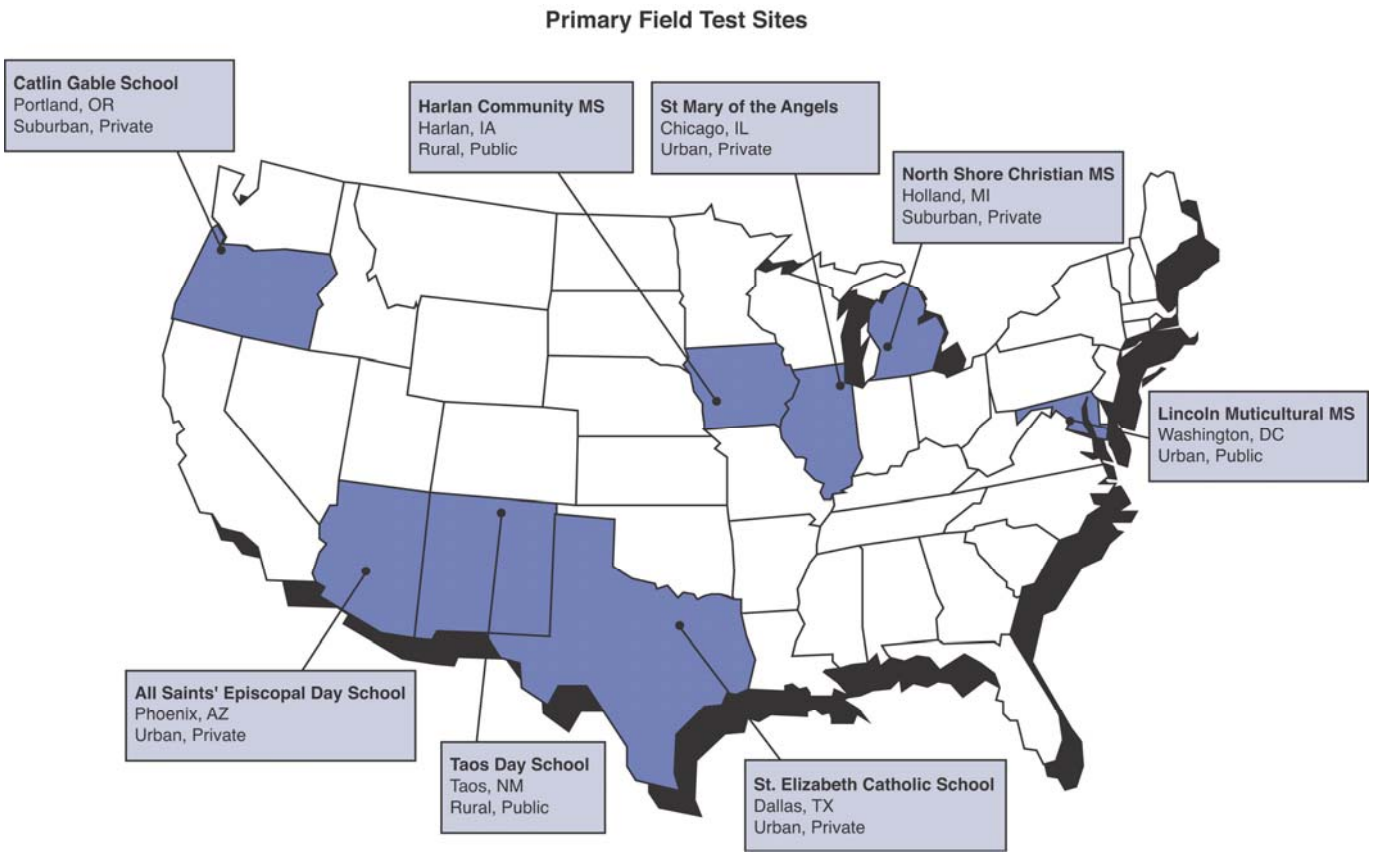
The students at the primary test sites ranged from 6th to 8th graders in middle school. There were 8 primary test schools in the study from school districts in Michigan, New Mexico, District of Columbia, Oregon, Iowa, Arizona, Illinois and Texas. **Figure 1 depicts the dispersed locations of the primary field test sites nationally.**

Table 1 and figure 1 depict the demographic information for the schools in the field test with approximate breakdowns of race/ethnicity using U.S. Census Bureau categories. These data come from the responses given by the students. Separate results are presented for the Primary site schools because they were used to assure inclusion of diverse groups. Totals for the Primary site schools as well as the Primary plus Secondary Site schools are included. The analyses in subsequent sections used the Primary plus Secondary site schools.

Table 1. Population Characteristics of Primary Site Schools in the Field Test n=8 and Totals for Primary & Primary plus Secondary Site Schools

School	n	% Asian	% Afr Amer	% Amer Ind	% White	% Nat Haw	% other (Hisp)	% 2 or more	% Female/ % Male	% 6th/7th/8th Graders	% Free Lunch
North Shore Christian School	55	1.8	0	1.8	92.7	0	1.8	1.8	62/38	0/100/0	1.8
Taos Day School	11	0	0	72.7	0	0	0	27.3	36/64	0/100/0	100.0
Lincoln Multicultural Middle School	17	0	41.2	0	0	0	52.9	5.9	53/47	0/100/0	76.5
Catlin Gable School	51	3.9	3.9	0	78.4	0	5.9	7.8	53/47	100/0/0	0
Harlan Community Middle School	142	0	0.7	0.7	92.2	0	0.7	5.7	55/45	0/100/0	16.3
All Saints' Episcopal Day School	63	3.2	1.6	0	73.0	3.2	12.7	6.3	47/53	0/100/0	0
St. Mary of the Angels	15	6.7	0	6.7	6.7	0	46.7	33.3	33/66	100/0/0	60.0
St. Elizabeth Catholic School	34	0	11.8	0	26.5	0	23.5	38.2	56/44	100/0/0	0
TOTALS FOR ALL Primary SITES	387	1.6	3.6	2.8	71.6	.5	9.6	10.1	53/47	25.8/74.2/0	14.7
TOTALS FOR ALL SITES (Primary & Secondary)	409	1.7	3.7	2.9	71.6	.5	9.6	10.0	52.7/47.3	24.4/70.4/5.1	14.0

Figure 1. Primary Field Test Sites



Description of the Evaluation Study

Purposes of the Evaluation

The evaluation has two primary purposes. The first is to gather evaluation data about the functionality and usability of the materials. The curriculum developers use formative evaluation findings to revise and improve the final version of the module. The second is to gather preliminary information about the modules effectiveness in achieving the learning outcomes.

Evaluation Design

Materials Evaluation Design.

There are two primary sources of data specifically on the materials: the Teacher Materials Survey (TMS) and the Student Materials Survey (SMS). Appendix A contains the instructions were given to the teachers to facilitate their administration of the surveys. Appendices B and C contain copies of the TMS and SMS respectively. The TMS contains a series of questions on the following topics for each lesson in the module:

- General Questions on the Lesson
- Effectiveness of the Lesson in Achieving Learning Outcomes
- The Website (Lessons 3 & 6 only)
- Effectiveness of the Activities
- Difficulty of the Materials for both Teacher and Student

Teachers responded to questions about each of these topics on a scale of Strongly Disagree to Strongly Agree (or Very Ineffective to Very Effective) and have space to make comments or elaborate on their ratings.

At the end of the TMS were questions about the overall difficulty of the entire module and what the most and least valuable aspects of the module were. The teachers were asked to make specific suggestions to the curriculum developers to improve the module.

The SMS has a reduced number of topics and items to which the students respond. Similar to the TMS, the students were asked to respond to items on the following topics for each lesson in the module:

- General Questions on the Lesson and,
- the Website (Lessons 3 & 6 only)

The students also have opportunities to make comments about the module and activities, identify the main strengths and weaknesses of the module, and make specific suggestions to the developers.

Pretest and Posttest Evaluation Design.

Student Data.

The evaluation focused on how effectively the materials helped the students achieve the learning outcomes for each lesson. The present study uses the "One-Group Pretest-Posttest Design" articulated by Campbell and Stanley (1963).

Campbell and Stanley represent the design as:

$$O_1 \longrightarrow X \longrightarrow O_2$$

The initial Observation (O_1) is the pretest, which is followed by administration of the experimental treatment (X) and then the second Observation (O_2) or posttest.

The initial observation (O_1) is of the **Student Knowledge Survey 1** (SKS1), a pretest of student knowledge that teachers gave their students before any exposure to the materials. Teachers then taught the module in their classes from beginning to end, until completed. This is essentially the classic experimental treatment (or X in Campbell and Stanley's diagram). The second observation (O_2) is a posttest composed of the same items as the pretest. These items are contained in the **Student Knowledge Survey 2**. Teachers administered the survey to students at the end of the field test. Appendix D contains copies of these surveys. The students answered True or False to statements from which their pretest and posttest scores were determined. In addition, they were given the option, in both the pretest and posttest of answering "Not Sure" on the items in order to estimate the level of confidence they had with their answers.

This type of scoring is often termed "ipsative", that is, the norm or comparison against which the student is measured is their own prior performance (a pretest). The present performance (a posttest) is compared to the prior performance. In essence, the posttest is the student's "personal best" although it may not be the best in the class. This type of assessment is useful because of the different of levels of knowledge or ability at which students enter a class (or use instructional materials).

Learning Outcome Effectiveness Evaluation.

Teacher Data.

The effectiveness evaluation also contains a second source of data. The teachers use the TMS to make judgments on how effectively the materials achieved each lessons learning outcomes. Achieving these learning outcomes is the ultimate goal of each lesson. Their answers provide an additional source of evaluation data.

Results

Surveys Returned.

The module was tested in 9 schools, from which a total of 409 complete student survey sets were received. A student survey set consists of a SMS, an SKS1, and an SKS2. All three are necessary for complete analysis of the student data. All teachers returned the TMS survey, therefore the teacher n=9.

Demographic Results from Surveys Returned.

The student surveys from all the schools in the field test yielded the following results: Female 52.7 % and Male 47.3 %. All results include both primary and secondary site schools.

Table 2. Pie Chart of Gender Percentages.

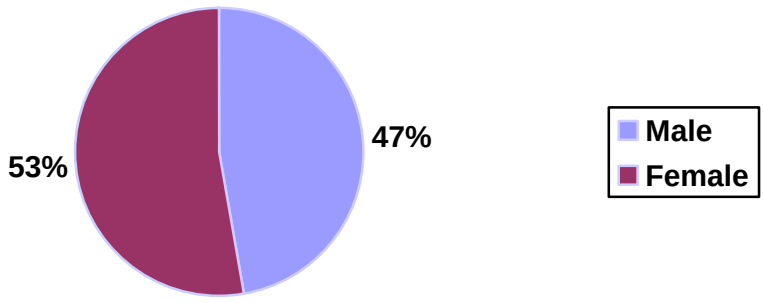


Table 3. Percentages in Census Bureau Categories. Table 3 depicts the results from the student surveys from all schools for the question on "Race/Ethnicity":

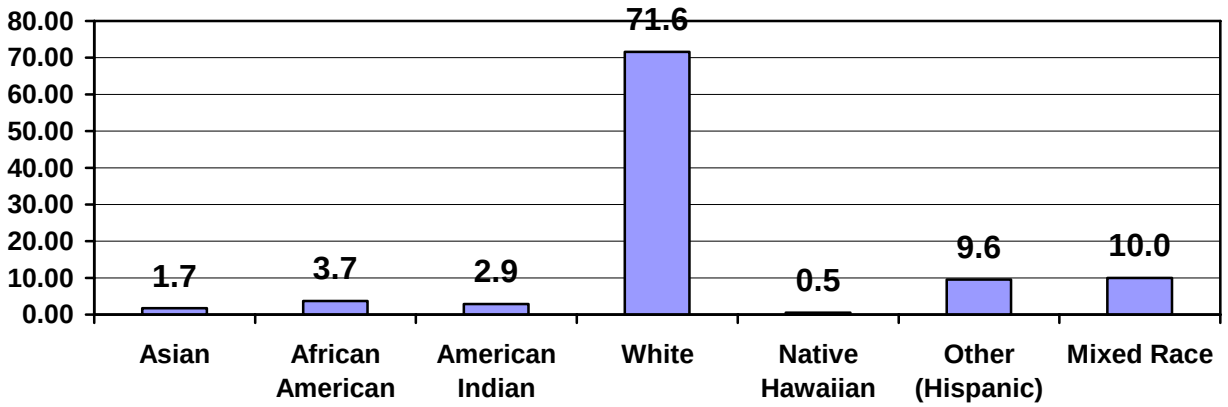


Table 4. Percentages of Students in Different Grade Levels.

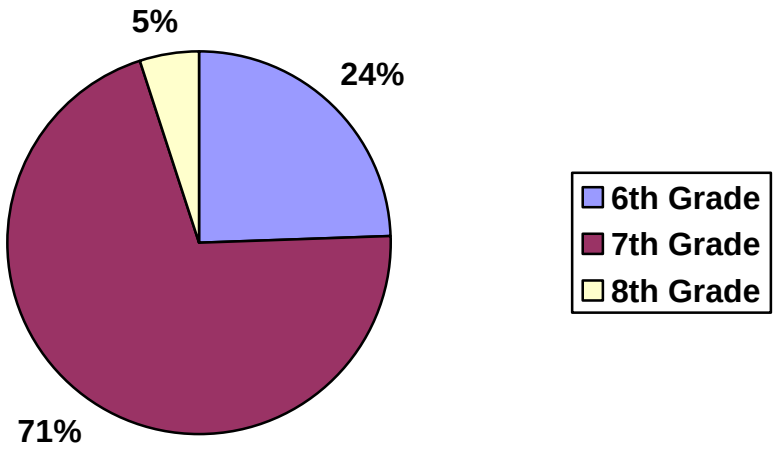


Table 5. Student Interest in Science: Students were asked to rate their agreement with the following three questions.

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. I am interested in science, in general.	3.4	5.9	11.0	26.7	38.5	14.5	4.34	1.23
2. I am very interested in Biology.	6.9	11.3	17.4	32.9	23.6	7.9	3.79	1.32
3. I am good at science, in general.	3.7	5.6	15.0	30.6	34.1	11.0	4.19	1.21

Results of the Materials Evaluation

The evaluation results come from questionnaires completed by the teachers and the students. Appendices B and C contain copies of the questionnaire for each group. The questionnaires were completed after they had concluded using the materials or while they were using the materials. There were demographic questions, fixed-response questions, and open-ended questions on both questionnaires.

The students indicated their level of agreement or disagreement from strongly disagree to strongly agree with statements in each section. The Tables in the following section provide the results in terms of the percentage of students who indicated which response. In addition, the items are assigned a value: Strongly Disagree = 1, Disagree = 2, Disagree a Little = 3, Agree a Little = 4, Agree = 5, and Strongly Agree = 6. With these values means and standard deviations were calculated and also are reported.

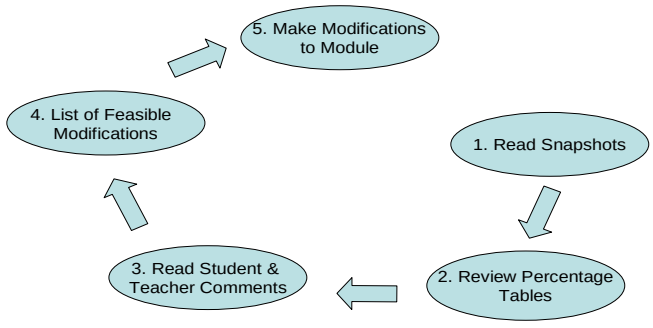
In addition, students were able and encouraged to make comments on any question in the survey on all lessons. The students were also asked to estimate the overall level of difficulty of the module, identify the main strengths and weaknesses of the module, and make specific suggestions for the developers to improve the module.

Utilization of Evaluation Results by Curriculum Developers.

This report is composed of a number of different types of information. The figure below is a suggestion for the developers to consider as they review the evaluation results to assist in making improvements to the module. It is suggested, as depicted in Figure 2, that developers:

1. Review the Evaluation Snapshots in Tables 6-12, going on to
2. Review of the Student and Teacher Percentage Tables in the Lesson Sections,
3. Read the Comments by Students and Teachers in each Lesson Section
4. Make a list of possible modifications to the module when factors such as feasibility, time, and cost are weighed, and finally
5. Make the modifications to the module within the time constraints of the project.

Figure 2. Utilization of Evaluation Results



Evaluation Snapshots of the Lessons.

It is useful for the developers who work on specific lessons to have a picture of the impressions of the teachers and students who used their materials. Tables 6-12 contain information extracted from other tables and placed here to provide a "snapshot" of each lesson. In addition, the rankings for the lessons are provided merely to give an idea of how they compare to other lessons. The rankings are meant to be useful only for gross comparisons. Sometimes the difference between ranks is great, sometimes the difference is quite small. Typical comments by teachers and students are included as well as an "Assessment". The assessment statements are intended to provide a starting point for the developers as they go into the next phase of the development process.

Evaluation Snapshots Activities 1-7

Table 6. An Evaluation Snapshot of Lesson 1: It's Alive! Or Is It?

	STUDENT RESULTS	STUDENT RANK	Typical Lesson 1 Student Comments:
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	
The lesson was interesting.	4.24	7	"I liked that our teacher showed us what's alive and what's not." "I think it was cool to see different relationships between the different objects." "I liked that we are learning in a fun way with examples and stuff." "I wish I could have been more involved."
I could read the material easily.	4.68	7	
I could understand the examples and explanations.	4.75	5	
I could understand the scientific information easily.	4.42	7	
The lesson made me think about new things and questions.	4.18	3	

	TEACHER RESULTS	TEACHER RANK	Typical Lesson 1 Teacher Comments
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	
Students should be able to describe characteristics of living systems.	5.22	N/A	"Good intro lesson, students' interest was peaked." "Past knowledge of 'living characteristics' helped the students see the similarities." "I liked the comparisons made – bone and chalk, skin and paper, muscle and rubber band. I thought it brought it to a level of understanding for the students."
Students should be able to explain characteristics of muscle, skin, and bone that allow these systems to be classified as living.	4.89	N/A	
The lesson was engaging.	5.11	5	
The lesson promoted thinking, inquiry, and study skills.	5.0	4 (tie)	

LESSON DIFFICULTY (1= Easy, 5= Just Right, 9 = Hard)	Student	Student Rank	Teacher	Teacher Rank
Lesson Difficulty for Students	4.41	2	5.22	5
Lesson Difficulty for Teachers	N/A	N/A	5.22	3

ASSESSMENT	Students and teachers rated Lesson 1 lowest in the areas of interest and reading but gave the lesson a good score in the "thinking about new things" category. Teachers described Lesson 1 as a good starting point for the module, working to capture students' attention early on. Some teachers commented that prior knowledge helped students make valuable connections between the material and their own lives. Students were very excited about the visual aids in the lesson, but wished that it was a bit more hands on. Overall, teachers thought the lesson did a nice job of grabbing student's attention but could have included more information about each of the systems. A mean time of 1.4 class periods was spent on Lesson 1.

Table 7. An Evaluation Snapshot of Lesson 2: What Makes Bones Strong?

	STUDENT RESULTS	STUDENT RANK	Typical Lesson 2 Student Comments:
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	"I liked when we worked in groups with the pasta." "I liked watching the experiment instead of reading from a book." "I like the way we had to compare the bath tub with the osteoblasts & osteoclasts." "Some of the topics were hard to understand." "After the hands on fun part, you just sat back down and listened. It should be taught during the fun part."
The lesson was interesting.	4.77	2	
I could read the material easily.	4.87	2	
I could understand the examples and explanations.	4.74	1	
I could understand the scientific information easily.	4.71	3	
The lesson made me think about new things and questions.	4.02	2	

	TEACHER RESULTS	TEACHER RANK	Typical Lesson 2 Teacher Comments
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	"I didn't think that the students would grab the concept, however they LOVED IT! They understood that the bands (collagen) help support the pasta (bones)." "A great deal of teacher prep was needed for this unit." "The bathtub analogy is a good one. Students appreciated the diagram." "The students learned a lot about bones but were confused with the role of the osteoblasts and osteoclasts and therefore did not understand well the bone in balance bathtub." "I enjoyed watching my students 'figure out' how they should design the experiment."
Students should recognize that there is a relationship between the structure and function of bone.	5.44	N/A	
Students should be able to describe how minerals, collagen, and stress affect the strength of bone.	5.44	N/A	
The lesson was engaging.	5.22	3 (tie)	
The lesson promoted thinking, inquiry, and study skills.	5.22	2 (tie)	

LESSON DIFFICULTY (1= Easy, 5= Just Right, 9 = Hard)	Student	Student Rank	Teacher	Teacher Rank
Lesson Difficulty for Students	4.19	7	5.78	3
Lesson Difficulty for Teachers	N/A	N/A	6.22	2

ASSESSMENT	Lesson 2 rated very high with both students and teachers. Students loved the hands on aspects of the lesson. Lesson 2 rated the highest compared to the other lessons in the area of examples and explanations for students, yet some of the teachers complained that students had some trouble distinguishing between osteoclasts and osteoblasts. Teachers, while highly rating the lesson, describe it as requiring a lot of prep time. Some make suggestions regarding prep time in the comments section of Lesson 2. A mean time of 2 class periods was spent on Lesson 2.

Table 8. An Evaluation Snapshot of Lesson 3: Anatomy of a Kick

	STUDENT RESULTS	STUDENT RANK	Typical Lesson 3 Student Comments:
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	
The lesson was interesting.	4.52	3	"This was easily my favorite one because it involved a computer." "It was interesting and kind of challenging." "(I like) that we got to go on the internet and do experiences ourselves." "I liked learning about what muscles we use to kick." "When you got the wrong order, the guys should have messed up and fallen or something." "Just guessing the order of how the muscles worked did not explain it well enough to know what they all do."
I could read the material easily.	4.86	3	
I could understand the examples and explanations.	4.76	4	
I could understand the scientific information easily.	4.59	6	
The lesson made me think about new things and questions.	4.06	4	
I was able to navigate easily in the website without confusion.	5.02	N/A	
The website helped me understand how to conduct scientific investigations.	4.48	N/A	
The website made the lesson more interesting.	4.89	N/A	

	TEACHER RESULTS	TEACHER RANK	Typical Lesson 3 Teacher Comments
Students should be able to explain that muscles produce movement by contracting.	5.22	N/A	"The class was very involved and discussed many other ways muscles work to provide movement in our body." "The website may be expanded a bit. It seems that the site could include some analysis of how the muscles move the legs." "Students were engaged and determined to pass the test." "Students enjoyed this lesson a great deal. We did find that 2 combinations of letters gave a correct response. I think that students would have liked doing another similar web activity."
Students should be able to explain that muscles are attached to bones.	5.56	N/A	
Students should be able to explain that opposing muscles or groups of muscles produce movement in opposing directions.	5.22	N/A	
The lesson was engaging.	5.89	1	
The lesson promoted thinking, inquiry, and study skills.	5.55	1	
The students were able to navigate easily through the website without confusion.	5.56	N/A	
The website aided in comprehension of the lesson.	5.89	N/A	
The website made the lesson interesting for students.	5.89	N/A	

LESSON DIFFICULTY (1= Easy, 5= Just Right, 9 = Hard)	Student	Student Rank	Teacher	Teacher Rank
Lesson Difficulty for Students	4.20	6	4.89	6
Lesson Difficulty for Teachers	N/A	N/A	4.44	5

ASSESSMENT	Lesson 3 rated as moderate with both students and teacher. The students were thrilled to use the computers and explore the lesson online, but complained that the website did not explain the concepts well enough. Teachers suggested that more of the information be added to the website because students enjoyed being online so much. Teachers described students as having the most difficulty with the concept of opposing pairs. The mean class time for Lesson 3 was 1.56 periods.

Table 9. An Evaluation Snapshot of Lesson 4: Helping the Body Build Strong Bones

	STUDENT RESULTS	STUDENT RANK	Typical Lesson 4 Student Comments:
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	
The lesson was interesting.	4.31	6	"I liked thinking about what would happen to the kids (exercise) body and bones when drinking milk and orange juice." "I liked how you could compare the examples of sports to what sports you did in your own life." "I learned which activities were the best for strength and fitness."
I could read the material easily.	4.74	6	
I could understand the examples and explanations.	4.74	6	
I could understand the scientific information easily.	4.64	5	
The lesson made me think about new things and questions.	4.02	6	

	TEACHER RESULTS	TEACHER RANK	Typical Lesson 4 Teacher Comments
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	
Students should be able to recognize the importance of diet and weight-bearing activities to the strength and health of their bones.	5.44	N/A	"Well put together: group studies, graphs, overhead." "Since this lesson wasn't as "hands on" as the other lessons I feel students weren't as interested." "Students were surprised (and wanted more info) on how/why astronauts lose bone mass in space. This led to a lively discussion on extended trips/stays in outer space." "I feel that the students understood the lesson, however their level of interest wasn't as great as the other lessons." "The topics of sports and astronauts generated much discussion in the classes – very engaging lesson." "Using actual research made it more relevant to us. Students could make a connection."
Students should be able to analyze data tables to make evidence based conclusions.	5.33	N/A	
Students should appreciate that more minerals, especially calcium, in bones makes them stronger.	5.56	N/A	
Students should understand that different types of weight-bearing activities produce different effects on the skeleton.	5.44	N/A	
The lesson was engaging.	5.11	5 (tie)	
The lesson promoted thinking, inquiry, and study skills.	5.22	3 (tie)	

LESSON DIFFICULTY (1= Easy, 5= Just Right, 9 = Hard)	Student	Student Rank	Teacher	Teacher Rank
Lesson Difficulty for Students	4.33	5	4.67	7
Lesson Difficulty for Teachers	N/A	N/A	3.78	7

ASSESSMENT	Lesson 4 ranked lower with students and moderately with teachers. Teachers felt the materials were quite easy to teach as well as easy for students to comprehend. Teachers stated that students became very engaged through discussions about sports and astronauts and made many connections to their own lives. However, teachers felt that this lesson, compared to the others did not hold students' attention quite as well and pointed to the lack of hands on activity as the culprit. 1.7 class periods were spent, on average on this lesson.

Table 10. An Evaluation Snapshot of Lesson 5: Use It or Lose It

	STUDENT RESULTS	STUDENT RANK	Typical Lesson 5 Student Comments:
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	"I learned about how some rats with no exercise had different muscle mass." "The rat resistance group project was fun and easy to do." "I liked how the idea of this lesson went on to do/make something else. I liked making graphs." "I liked how we got to do the graphs and use the models of rats." "I did not like that animals were harmed in a an experiment that we used as learning material."
The lesson was interesting.	4.45	4	
I could read the material easily.	4.77	5	
I could understand the examples and explanations.	4.70	7	
I could understand the scientific information easily.	4.64	4	
The lesson made me think about new things and questions.	4.04	5	

	TEACHER RESULTS	TEACHER RANK	Typical Lesson 5 Teacher Comments
	Average Score (1=Strongly Disagree 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	"We had a very good discussion concerning animal use for scientific research. It was not a subject they had considered previously and they had many questions and concerns." "I really liked the graphing." "They could easily relate this lesson to real life – if they ever had a cast on their leg and once it was removed they did notice differences in size and strength, they could certainly connect with this idea."
Students should be able to describe how resistance training influences muscle.	5.33	N/A	
Students should be able to recognize that animals such as rats are used as model systems in research.	5.56	N/A	
Students should be able to use mathematics to organize and present data.	5.33	N/A	
The lesson was engaging.	5.33	2 (tie)	
The lesson promoted thinking, inquiry, and study skills.	5.22	3 (tie)	

LESSON DIFFICULTY (1= Easy, 5= Just Right, 9 = Hard)	Student	Student Rank	Teacher	Teacher Rank
Lesson Difficulty for Students	4.39	3	5.89	2
Lesson Difficulty for Teachers	N/A	N/A	4.33	6

ASSESSMENT	Lesson 5 ranked in the mid to low level with students. Students also thought that lesson 5 was harder than many of the other lessons. Students had a hard time with the examples and explanations and rated them the lowest out of all of the lessons. Students reported discovery of the issue of animal testing during this lesson and many made comments referring to the harsh reality of the issue. Teachers felt that the conversations that developed out of these realizations were very valuable. Teachers also mentioned the graphing exercise as both valuable and challenging for students. The mean time for this lesson was 1.7 class periods.

Table 11. An Evaluation Snapshot of Lesson 6: Shining the Light on Skin

	STUDENT RESULTS	STUDENT RANK	Typical Lesson 6 Student Comments:
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	"The website didn't answer my questions, there was not that much data."
The lesson was interesting.	4.80	1	
I could read the material easily.	4.96	1	"The website made this lesson interesting, but the website was also hard to understand!"
I could understand the examples and explanations.	4.93	2	
I could understand the scientific information easily.	4.89	1	"I liked using the SunCheck and seeing if putting different things over them would make them turn blue slower."
The lesson made me think about new things and questions.	4.41	1	
I was able to navigate easily in the website without confusion.	4.55	N/A	"We got to conduct our own experiments."
The website helped me understand how to conduct scientific investigations.	4.25	N/A	
The website made the lesson more interesting.	4.18	N/A	"The website wouldn't answer any of my reasonable questions."

	TEACHER RESULTS	TEACHER RANK	Typical Lesson 6 Teacher Comments
	Average Score (1=Strongly Disagree 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	"Unfortunately, my suncheck timers didn't come in for this activity."
Students should be able to use SunCheck Timers to estimate when they have received the maximum daily safe exposure to sunlight.	5.33	N/A	"I cannot evaluate this because we did not have access to the website. Our system did not let us in to use the website."
Students should be able to formulate a testable question about exposure to sunlight and conduct an investigation.	4.83	N/A	"I tried to add our data to the website – not sure if it was successful. When we tried to use the website for activity 1 the report results were often 0.00"
Students should be able to analyze and interpret data tables.	5.17	N/A	
Students should be able to assess the effectiveness of various types of sun protection.	5.50	N/A	"The SunCheck timers were a hit. Students generated all kinds of ways/ideas to check sun exposure (lots of "what if" questions)."
The lesson was engaging.	5.29	3	
The lesson promoted thinking, inquiry, and study skills.	5.43	2	"Initially I had trouble finding a company who had the SunCheck timers in stock."
The students were able to navigate easily through the website without confusion.	4.0	N/A	
The website aided in comprehension of the lesson.	3.67	N/A	
The website made the lesson interesting for students.	3.67	N/A	

LESSON DIFFICULTY (1= Easy, 5= Just Right, 9 = Hard)	Student	Student Rank	Teacher	Teacher Rank
Lesson Difficulty for Students	4.44	1	6.50	4 (tie)
Lesson Difficulty for Teachers	N/A	N/A	6.29	4

ASSESSMENT	Lesson 6 was rated the highest by students in almost all categories even though there were quite a few complaints about the lack of data on the website. The SunCheck timer was a hit with both students and teacher. Some teachers had difficulty finding and/or obtaining the timers, but those who did felt that they were very valuable for the students. Teachers stated that they were impressed with the discussions and questions that students formulated during and after the activity.

Table 12. An Evaluation Snapshot of Lesson 7: Decisions Today for a Healthy Tomorrow

	STUDENT RESULTS	STUDENT RANK	Typical Lesson 7 Student Comments:
	Average Score (1=Strongly Disagree, 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	
The lesson was interesting.	4.35	5	"What I liked about this lesson was we had a good time working as a group and reviewed all the information we talked about." "I liked writing about how our behavior affects our skin, muscles and bones." "I enjoyed listening to other people's posters and working on them." "[I didn't like] when we had to present our poster for the science fair."
I could read the material easily.	4.96	4	
I could understand the examples and explanations.	4.93	3	
I could understand the scientific information easily.	4.76	2	
The lesson made me think about new things and questions.	4.02	7	

	TEACHER RESULTS	TEACHER RANK	Typical Lesson 7 Teacher Comments
	Average Score (1=Strongly Disagree 6=Strongly Agree)	Rank with other Lessons (1=highest, 7=lowest)	
Students should be able to appreciate the roles of living cells in the muscle, skin, and bone systems.	5.13	N/A	"Students got involved in their posters – many were very creative in expressing the key points of the unit." "This lesson was great for trying all the information together. Students worked in pairs and made posters, brochures or TV commercials. Students illustrated the concepts they learned during this module in their posters, etc." "This lesson was good because it allowed students to demonstrate what they'd been experimenting on throughout the past weeks. It was a good way to end the field-test."
Students should be able to recognize relationships among the structure and function of the muscle, skin, and bone systems.	5.13	N/A	
Students should be able to explain how muscle and bone interact to produce movement.	5.63	N/A	
Students should be able to describe how lifestyle choices can influence the health of the muscle, skin, and bone systems.	5.63	N/A	
The lesson was engaging.	5.13	4	
The lesson promoted thinking, inquiry, and study skills.	5.0	4 (tie)	

LESSON DIFFICULTY (1= Easy, 5= Just Right, 9 = Hard)	Student	Student Rank	Teacher	Teacher Rank
Lesson Difficulty for Students	4.39	4	5.25	4
Lesson Difficulty for Teachers	N/A	N/A	4.89	4

ASSESSMENT	Lesson seven rated right in the middle for both students and teachers. Students were excited to show what they learned throughout the module and teachers felt that the brochure/poster assignment worked well as an outlet for expressing the new knowledge. Teachers stated that this lesson was a bit less interesting for students. Students were excited to work in groups. Mean class time spent on Lesson 7 was 1.88 class periods.

Lesson 1: It's Alive! Or Is It?

Lesson 1: Teacher Results

Table 13. Lesson 1: *It's Alive! Or Is It?* General Questions

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson contained an appropriate amount of content.	0	0	0	33.3	55.6	11.1	4.78	.67
2. The lesson promoted thinking, inquiry, and study skills.	0	0	0	11.1	77.8	11.1	5.0	.50
3. The lesson was engaging (that is, it got students more interested in the science content).	0	0	0	11.1	66.7	22.2	5.11	.60
4. The lesson took an inquiry-oriented approach.	0	0	0	11.1	66.7	22.2	5.11	.60

Comments:

The two examples for each system was a powerful visual - it really captured their attention and generated the discussion.
This was a good introduction to the topic. There is an issue with characteristics of "Living Organisms" vs characteristics of "living systems." Students often have already studied what life is and readily identify these characteristics. I think there needs to be more discussion on the differences between organisms and systems.
Lesson one seemed a little too "open" I was hoping for more content as far as "teaching" instead of just "telling"
Good intro lesson, students' interest was peaked.
Good use of material for the lesson.

Table 14. Effectiveness of Lesson 1: *It's Alive! Or Is It?* Materials in achieving Learning Outcomes

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. Students should be able to describe characteristics of living systems.	0	0	0	11.1	55.6	33.3	5.22	.67
2. Students should be able to explain characteristics of muscle, skin, and bone that allow these systems to be classified as living.	0	0	11.1	22.2	33.3	33.3	4.89	1.05

Comments:

Our students had already had instruction on characteristics of living things and cells and cell structure so this concept (should have been) was easy.
Perhaps more data which shows that these three systems have all these characteristics.
Students' ability to describe these things depends on prior exposure to living systems.
*Please note: Some students may be missing an evaluation sheet. This is due to their absence. They could not complete the questions (evaluations) for something they missed.

Table 15. Effectiveness of Activities in Lesson 1: *It's Alive! Or Is It?*

	Very Ineffective 1	Ineffective 2	Mod. Ineffective 3	Mod. Effective 4	Effective 5	Very Effective 6	Mean	Std. Dev.
1. Overall, lesson 1: *It's Alive! Or Is It?* was	0	0	0	11.1	55.6	33.3	5.22	.67

Comments:

Concrete examples of living vs. nonliving- excellent!
Past knowledge of "living characteristics" helped the students see the similarities.
Students were able to focus on the topic of the lesson and look toward the next.
It was a good way to start the children to thinking about the 3 systems.

Lesson 1: *It's Alive! Or Is It?* Overall Difficulty for the Student as Rated by Teachers.
The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 1 difficulty mean = 5.22, std. dev. = 1.20.

|_____X_____|
1 2 3 4 5 6 7 8 9
Extremely Easy — Just Right — Extremely Hard

Lesson 1: *It's Alive! Or Is It?* Overall Difficulty for the Teachers (i.e. preparation, delivery, etc.).
The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 1 difficulty mean = 5.22, std. dev. = 1.86.

|_____X_____|
1 2 3 4 5 6 7 8 9
Extremely Easy — Just Right — Extremely Hard

Comments:

Well thought out and constructed. Excellent way to begin the unit.
You refer to "cells" again in lesson 2, #29 yet in lesson 1 you don't emphasize that that should be a focus point.
I liked the comparisons made - bone and chalk, skin and paper, muscle and rubber band. I thought it brought it to a level of understanding for the students.
I find myself referring back to the instructional manual frequently. This is distracting to the class. I thought the summary on the living systems was a way to bring together what the class was thinking but it seemed a bit limiting in scope.
Good intro lesson. Would work great with a little more information of each which teachers could opt to do.

Table 16. Total Number of Class Periods spent on Lesson 1: It's Alive! Or Is It?

	1	2	3	4	5	Mean	Std. Dev.
Class periods spent on Lesson 1	66.7	22.2	11.1	0	0	1.44	.73

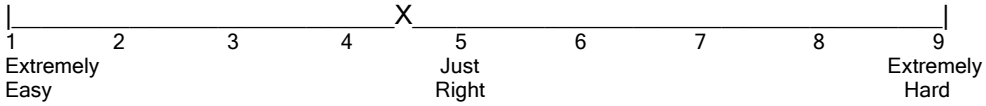
Lesson 1: Student Results

Lesson 1: *It's Alive! Or Is It?*

Table 17. General Questions on Lesson 1: *It's Alive! Or Is It?*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson was interesting.	2.8	5.9	12.1	35.4	31.3	12.6	4.24	1.17
2. I could read the material easily.	0.8	3.1	11.3	21.1	39.6	24.2	4.68	1.10
3. I could understand the examples and explanations.	1.0	1.8	7.4	23.6	43.1	23.1	4.75	1.02
4. The lesson made me think about new things and questions.	3.9	9.0	13.1	30.3	26.5	17.2	4.18	1.33
5. I could understand the scientific information easily.	2.1	3.6	14.2	26.8	37.1	16.2	4.42	1.15

Lesson 1: *It's Alive! Or Is It?* Difficulty.
The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the students to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 1 difficulty mean = 4.41, std. dev. = 1.59.



Student Comments on Lesson 1:

Could you make the lessons more interesting so I could think of questions to ask? Thanks.
It was great
What scientific stuff? We talked about house hold things.
Sometimes I could not tell exactly what the point of this lesson was, but otherwise it was good.
This was awesome lesson.
This study was very easy to learn things from.
I thought it was fine
I thought this lesson was very cool to me and interesting. I would hope to have more lessons similar to this one.
It was cool that she brought stuff to show us, it was cool.
The way our teacher explained and the materials she used was easy to understand.
It was cool and funny
I liked that our teacher showed us what's alive and what's not alive.
It was funny, I learned some stuff about why we have muscle, skin and bone
No
There wasn't much information and material to read.
I thought it was easy to understand and interesting enough for me.

I already knew bout a lot of it but it was still fun.
The examples were very interesting to see.
I had already talked about some of the material with my dad so it wasn't all new.
I thought the information I learned was very interesting. I could read the info easily but a couple of things; I did not get, but now, I do.
It was very hard to understand and I didn't really like it.
The examples were very interesting to see.
Kind of confusing, moves fast. Very interesting visuals
I think I got the lesson and I learned a lot, know more about what's on the inside of my skin
I like to be hands on and involved, that is why I enjoyed this lesson.
The project was fun but after awhile, it got kind of boring.
No offense, but I thought we should have had more hands on experience
This lesson was boring at times
I liked the examples of the chicken bones and rubber band and meat.
I couldn't understand the examples and explanations.
I couldn't understand the material easily.
It was boring
This lesson was the most interesting, hands on activity I've done all year.
Add a website page
I liked everything I understood it and I thought it was cool.
The lesson could have been more interesting
Most of it I could understand

What did you like most about lesson 1?

It was the pasta and rubber bands to model how minerals and collagen contributed the difference between bones and strong.
I liked the part when we put the rubber bands on the pasta & it did not fall off.
I liked when we did the exercise about the chicken bones and when we did the exercise on the computer.
I liked the part when we put the weight on the pasta.
What I liked most about this lesson is that it teaches me how to tell the difference between the things that are alive and the things that aren't alive.
The thing I liked mostly about this lesson is the fact that I found out what bones are made of.
I liked looking at the meat.
Learning why bones are so strong and that they are very important part of our body.
What I liked about this lesson was that you had to compare bone muscle and skin with things in the class room.
I liked mostly everything like when we did the pasta, or the time we did the one on the meat, the folder and chalks.
I liked that we saw the bones reacting to weight.
I liked it when we looked at all of the meat and the chicken skin.
I liked the skin because some skin don't stretch that long.
When Ms. Holland showed us the bone meat and other objects.
What I liked most about this lesson, it was interesting and I learned new things.
It was kind of fun, we learned how bones were very strong.
Passing around the chicken bone.
How we compared on the stuff and how what the muscle can do for us
I liked comparing the objects, it was fun thinking of adjectives that fit both.
Straight forward approach
I liked how we saw actual examples instead of just pictures.
I liked how there was not a lot of work to do.
How we compared it to everyday materials.
Making guesses for muscle, skin and bones!
Comparing things in our body to things we use in everyday life.
I liked the comparisons between skin and paper.
I liked thinking of characteristics of living things.
When we compare bones to chalk and ect.
I thought it was kind of cool to relate things from the outside world to parts of the body (turkey, chicken or anything they're still living)
I liked comparing bones from chalk, skin and paper and muscle from rubber bands.
I liked feeling the bones etc.
The spaghetti study
I liked all the examples with noodles chalk, rubber bands and paper
I liked figuring out what makes things alive.
The simplicity, no homework
Seeing the similarities on the items
Everything but below
The lessons were all fun
I am not really sure
I liked that it made me think
Making the connections to the different things.
I liked the comparisons to paper, chalk and rubber bands.
I got to learn more about the similarities of living things of the body and the non-living.
Seeing the chalk and bone, the skin and paper and the muscle and rubber bands.
I think it was cool to see different relationships between the different objects.
I liked looking and asking questions about the skin, muscle and bones.
I liked comparing materials
I liked comparing the objects on the plates a little.
I could relate to the materials
It was cool to look at what was the same about the objects and body parts.
It was fun, but kind of gross and I like sometimes touching and looking at things that are different and gross.
Don't remember
I thought it was fun to learn about these things.
I liked comparing the different things.
This lesson in general was a good one. The best part was the beginning activity with muscle, skin and bone.
I liked comparing the object w/a man-made thing.
It let the whole class participated instead of working independently.
I like looking at man made and not man made things compared.
Learning new things
Finding things that were the same or different between the different things.
Use it or lose it.
I liked that she compared everything to something.
It was cool that we got to actually see the stuff. I liked the lesson!
It was cool and nothing bothered me
That she had stuff to show us
I liked all of it
I liked that we all did everything together.
How our teacher used the meat for example
It was an activity and it was fun

What we talked about
To see how many bones and muscles people have
It was different than other things
The squishy bone in vinegar
The tangible examples
website
Skin, bone and muscle, learning about them
How we don't get our muscles until later
The examples of objects
The bone comparison
The bones that were soaked and how each were different
Seeing chicken skin that was raw!
Website
Things that I didn't know before
The thing were he ripped the chicken skin
The thing I loved most about this lesson was the examples and explanations. I could understand it very much.
How it explained that bones, muscles and skin….
Learning the real life examples
I liked learning about how the muscles work.
The example of the chicken
Seeing how much the bone bleed when soaked in vinegar
The examples
Learning about our skin and bones
The paper analogy
How cells are even in bones
I liked the examples and comparisons
It was cool to compare
I learned about things I didn't know and it was very interesting.
I learned how bones move within the body
Visual Stuff
I liked the discussions (the drills) because it was a fun topic for me.
The examples used
I didn't have a favorite
I liked the bone that was soaked in vinegar. It was cool how it bended.
I didn't like it
Computer program with the muscle guy kicking the ball.
Every living thing has cells and what their characteristics
I liked the experiment the best, it made it more interesting.
The examples with the chicken skin made it fun.
I liked the comparisons
Looking at the different items and trying to come up with something that was in common between it and bones, muscle or skin.
It was easy to understand
It was very informative and taught me a lot of new things.
The physical examples
I learned about bones, muscles and skin through the internet
That I was right when the question of which noodles would bend more was asked.
I liked the visual aids, comparing the skin, muscle and bones to paper, rubber band and chalk, noodles and bundles.
Too Easy to like
The examples
I liked learning about how parts of our body are alive but you wouldn't think they are.
The visuals were interesting
The examples were fun to watch. They caught my attention
It was simple but interesting
Nothing
Learning more and understanding what's on the inside and all about how we move.
Discussing about the food
Learning what all living things have
We worked in groups
Seeing the food
The food
Talking about the items
It was easy to understand
It was very short and you could see what they are talking about
It was interesting

It was quite easy, I liked working with the group.
The examples
I liked the discussion with our whole class. Things were shared easily.
It involved everyone
Work in groups. Bones
Thinking of things that living things do.
Learning more things about bones, skin and muscles.
The visual examples, teacher explaining everything instead of reading.
It made you think about what is alive or dead in your body.
Looking at the chicken skin meat, paper and rubber bands.
Working with a group to do it and the top part.
It was short
It was easy to understand
I liked learning that our body can move with different parts.
Getting into groups
I liked the part were we looked at the meats and the other things.
Got to work with partners
Learning how the muscle, skin and bones work.
That we could learn about things I didn't know about.
The visual part
I liked filling out the chart and learning more about my body.
The demonstration that was with it.
Comparing the multiple materials.
Hearing other peoples ideas
It was fun
I liked the fungus growing and bones
The comparing
Learning about the body.
Deciding what the part did.
Looking at the examples
I learned about my body
The sheet
I liked that we are learning in a fun way with examples and stuff.
It was kind of easy and kind of interesting.
I liked that stuff
Very fast
What I learned
The examples with bones and stuff.
Common and differences about objects.
Learning what your body can do.
Common and differences with items
It was easy
Working in groups
Learning the difference in breaking a bone that contains high amounts of calcium compared to breaking above that has low amounts of calcium.
The rubber bands and chicken - comparing
little homework
activity
I liked when we learned about things, new things to me anyway.
the computer
Making the poster
I liked breaking the chicken bone
watching the bones break
the examples
learning differences in bone, skin & muscle, how they work together.
the comparing of materials
the breaking the chicken bones
Breaking the bone
I learned new things about bones and muscles.
I got to visually see objects and differences. I got to touch objects like bones.
The chickens - how we compared thing like a chicken leg to something, etc. and how we worked as a class to think of ideas.
Breaking the chicken bones
All of it
The experiment with the chicken bones
I liked all of the lesson but chicken skin
how exercise affects your bones in different ways
I got to break bone

The chicken skin
the visual aids
Doing the project with the chicken bones
How much weight can a bone handle
Breaking the chicken bones
The examples and explanations were very helpful.
trying to relate different things
discussing with the class
learning
That it had lots of information
Trying to break the chicken bone
we were listing differences and similarities of chicken bones and skin.
Breaking the bone
Breaking the bone
It was hands on and you got to visualize.
Breaking the bone
The experiment with the pasta noodles
comparing chicken skin to paper
This lessons model comparing the bones, skin and rubber bands was interesting.
I don't know, it was too boring
I liked it when we broke the chicken bones
Breaking it
the chicken bones
when we broke the chicken bone
Their not easy, but it's not to hard.
I didn't like any of it because I didn't learn anything.
There wasn't much homework, broke the chicken bones.
I liked the demonstration
bones
seeing how different minerals that the bones have and if you take one away how it effects the bone structure.
When we compared each item and told how they were alike and how they were different.
Coloring the muscle on the dinosaur
that the teacher said her son came home and was grossed out about the chicken bones
Just learning about muscles and how they work.
I liked the cows
Met Jeff got to break the bone
the bone
I enjoyed all of the experiments and examples that we got to do and see
It wasn't boring. It was kind of exciting the way we used chickens.
The project and activities
the chicken stuff
I liked about it was when we did a project over muscle, skin and bone and one person broke a bone and Mrs. Maronn put it in vinegar.
trying to break the bone
I liked watching them break the bones.
Where we compared things
It had examples we could touch
I liked how we found out new information and we didn't have to do much anything on it.
don't know
Characteristics
The "chicken" examples. (it was entertaining)
learning about the characteristic of living
It was very interesting.
The experiments with bones
that we studied something new
the timers
When my class compared the paper with skin, bone with chalk & muscle to rubber band.
Brainstorming
The skin that our teacher showed us
Sun dial things
I like the demonstrations
When we learned about our muscles because I love to work out! I love to be strong, so this lesson really helped

The jars and Mr. Knoell subbing
When we felt the squishy bone and the other kinds of bones.
when we broke the chicken bone
I like how we could use something that once living like a chicken.
the examples were easy to follow and understand
Learning the info
I liked it all
Everything
I liked everything about this lesson
Learning about the different systems
The chicken example
I don't remember
That I could learn about the body. When we broke the chicken bone
Breaking the chicken bones
I liked the bowl thing
I don't have a favorite.
I liked the demonstration
When we wrote down stuff
It was easy to follow and understand everything we talked about.
The way it gave me more information to learn
the bones in the jar of water and no homework
I liked the COWS
I liked the experiment with the bones in the water, vinegar etc.
comparing the non living things to the living ones
I liked that we did the experiment putting the chicken bones in bleach, water and vinegar.
Getting to be able to actually see and feel a chicken bone!
Chicken bones
I wasn't here for it.
The experiments
I liked the whole thing.
Learning about bones
the chicken bones
I liked everything in lesson of the module
having fun
The experiments
Finding about the things that can weaken the bones
All of it
Didn't really like anything
I learned that I should be more safe outside b/c I could get skin cancer.
I liked studying the bone
Everything
No homework
Mr. Koell being out sub Me and Reid got to break the bone
all of the different kinds of bones
breaking the chicken bone - (bones can break, but not easily).
that I could learn about the body
I liked activity
Seeing how bones & muscles work
bone
it was fun sometimes and I learned a little.
Comparing the things.
learning about the different kinds of bones
That you teach us about how the skill is related to the other parts of body
the worksheets
When we compared & did worksheets
Comparing chicken skin to paper, muscles to a rubber band and bones to chalk
The material we covered
that we got to learn more about our living body
the bone part stuff
I like the examples
Learning all the new things
That we got to compare things.
I like the questions
I liked that I got to know more things for my body and what parts go in each category.
I like learning about the muscle.
It was very good.
What the materials looked liked when they were soaked.

I liked looking at the chicken bones.
Seeing what happened after we put the chicken bones in different substances.
The experiments that we did in class.
comparing the objects
seeing the bones
Comparing a things
I liked learning about similarities and differences of living and non-living things
The comparing of the objects.
Discussing how the things were alike & not alike.
That I learned more things about the bones.
I liked comparing the objects.
Comparing the chalk and the bone
It taught me a lot about bones & muscles & how they work together to create movement & strength.
Looking at the skin.
Learning about the different bones we have.
the comparison of the chalk and the chicken bon (etc)
It showed me similarities between everyday objects and chickens
The knowledge I gained
The bones, the way they were when they were in the water, vinegar and bleach.
I like the explanations
The examples
Learning about muscle
I liked everything that we did in this lesson.
I liked when we did experiments with the lesson.
I like the questions that were asked in the lesson and that the questions were reminding me of what I really know.
To learn how your skin holds everything together.
How muscles, bones, and skin work together.
The way bones and muscles cooperate to move your body
learning about skin, muscles, and bones.
I liked the comparison between the living things and the things

similar to that.
I liked when we did the thing with the chicken bones.
What I liked most was that it was interesting.
seeing all the different things and what they are or were they came from
How it allowed us to compare household items to skin, muscles and bone of animals.
What I like most this lesson is mostly everything but my favorite was the graph and the examples.
Testing the bones and the skin, when one was soaked in vinegar, etc.
I truly really didn't like anything about this lesson. It was kind of boring. It need a little more spice.
I like how the bones and joints, muscles and skin would like join together to make a person's body.
I found out that some things are alive but it does not look like it.
Being able to learn about the chicken skin
Being able to see examples of stuff that goes on in stuff inside a body.
I liked the examples
I like seeing the examples like the bones, skin, and muscles.
Learning about bones
They used muscle skin and bones
I liked the examples.
the comparing or ordinary things and calling them not ordinary things
Looking at the skin.
Looking at all of the bones and muscles and learning about them.
I liked the way we compared chicken skin to the paper and the others.
I like the part about comparing the bone to the chalk
What I like most about this lesson was we got to use real bones, skin and muscles from animals to see what it is really like.

What did you like least about lesson 1?

I did not like the part when there were something's I did not know.
I liked everything, it was something different.
I hated the lesson about the rat.
I liked everything.
I liked everything.
I least liked looking at the items.
Nothing, I liked the lessons.
I liked least when Ms. Holland hold up that piece of meat.
I did not like when we had to write the measurements.
It was somewhat boring.
What I liked the least was the vitamins part.
Nothing, I liked the lessons.
It was a bit confusing at the beginning.
That it was kind of simple, but it was okay. Some of the instruction were confusing.
It was not very interesting.
How long it took to get the message.
I thought all of it was okay.
What I liked least about this lesson was that there was not a lot of active things to do.
I can't remember if I disliked it at all.
Making looking at the chicken muscle.
It was kind of pointless.
I liked everything about this lesson.
I disliked filling out the worksheet.
The muscle was nasty
The hand outs
I did not like doing work sheets.
Hard to say
Thinking of something to say
Comparing the bone, skin and muscle
I don't know

I did not like seeing the muscle and skin.
It seemed a bit relevant
Nothing was bad about this lesson
We did not go through it thoroughly.
I loved everything
Doing the chart, I did not get it.
Nothing really
It was sort of boring. We did the same thing for each plates and just made comments on them.
It was monotonous
It was really easy.
I did not like when I had an idea someone else would say what I had.
I did not like the rat thing
The skin kind of gross me out
I don't know
The anatomy of a kick segment of the lesson was a little boring and did not convey a large amount of information.
I don't know
Being put on the spot when you gave your comparison.
It got boring after a while
I don't know
I can't remember what I liked least about this lesson.
None
I liked the whole lesson
It was ok.
It was all good
I liked it all
Everything ok
I did not like that we went through everything fast
Reading
Writing stuff down

I liked the lesson
I liked the lesson
Nothing
The meat was gross
touching the bones
Nothing
It wasn't as interesting
The interesting part & material
Seeing the raw meat having to carry around was gross
Nothing
I liked everything
The thing I did not like about this lesson was that it made me think about new things which got me confused.
It was kind of boring, it was ok but didn't seem to have a point.
Nothing really
Nothing
I loved it all
Seeing everybody gross out when touching the bone
More notes
That the lesson seemed to be a little easy.
Chicken skin was gross
That the lesson was easy and boring.
Chicken skin
I didn't help enough
I liked all of it!!!
It was too short
It was all good
I thought all of it was good enough
I liked everything!
I liked it all.
It was not good enough to remember
N/a
Bones, muscles and skin cells looking at chicken parts.
The bath tub thing was weird.
There wasn't anything I didn't really like about the lesson.
I didn't like how I felt that there was nothing to relate to.
The lab was informative, straight to the point and demonstrated the information in an easy to understand fashion, so really, nothing was bad, so I don't dislike any of the lesson.
It was a little too easy.
I didn't quite get some of the info.
Nothing was better or worse.
All the answers were yes. It made it easy and I didn't think about the notes we took.
That it was hard to understand.
I didn't like determining whether bones, muscles and skin were alive and why?
But it is sort of pointless to have selections when they are all living.
There wasn't anything I didn't really like about the lesson.
There wasn't a part in this lesson that didn't interest me.
Moved a little fast, little hard to understand
I don't really understand everything/tried to make it too fun
I think they could have taught more
Informality, meaning I didn't like how info wasn't laid out, but we had to come up with theories
The work sheet
We didn't do any "hands-on" things
Not much
It didn't make sense to me
Writing
Not very interesting
You didn't have to do very much hands-on stuff.
It didn't take that long
The paper and the group I was in.
Having to talk about the materials splitting in 2 (two) and how it could not be the same thing again.
It wasn't interesting.
Didn't learn much. Boring.
It wasn't very hands on or interesting.
Nothing really
The last sheet.

It only had three parts of your body.
I don't really know, it was easy and kind of boring.
It was pretty easy
It was easy
Not that interesting
I liked the whole lesson.
What we had to do
I least liked the part were we didn't get any hands on things.
Nothing
Nothing
Nothing
Nothing
The speech
The writing assignments
It was kind of gross
Filling in the sheet
Small graphs
Writing and making questions.
Boring, a good lesson needs more difficult problems.
We mostly sat and looked at overheads and worksheets.
homework
I liked everything about it. Absolutely nothing was boring to me.
it was interesting
The computer site
thinking about the differences
the smell of the meat
I liked everything about the lesson.
the comparing of materials
participation is low
It was boring
It had a lot of worksheets
I wish I could have been more involved.
doing work
I liked it all
there was nothing I didn't like
The chicken skin was not cool
There wasn't anything that I didn't really like, it was all interesting for me.
Confusing
I enjoyed that lesson
more information involving why bones break
It was boring
The sun & UV ray
The worksheet
The materials was somewhat fuzzy at first.
writing
no study guide
That it was pretty hard
Finding the similarities between the two.
I don't remember what we all did
talking about the skin
I don't remember
It was too easy for most and got odd quickly.
the project at the end
it was a little boring and did not challenge me.
everything in the lesson
When we touched the bone that was in vinegar
the smell
Don't know
The homework
The fact that I already knew most of the stuff like about the bones breaking.
We had some homework
I am not sure
skin
the bath tub worksheet
Extremely hard to understand. I didn't understand the point of the dinosaur
we just sat here and she talk
Taking the test and bones
I liked it

Jeff mouthing off to me
I don't have a least favorite
I didn't like the rat lesson, it was boring!
could be a little more clear
The worksheet we did
what you do with your mice
What I liked least about it was when we presented our projects to everyone.
I enjoyed everything!
The survey. It was harder than I thought.
It didn't interest me
Nothing really, I thought it was very interesting!
Don't know
Not hands on
Nothing. I liked it all.
All of it
You should have more activities
Cows
we looked over some confusing stuff
the time it took to cover this!
It was a little bit easy for me, it didn't really make me think that hard.
It was not hands on
Bone content things
It was kind of boring
The bones, I didn't really care much because it wasn't very useful.
Reid got to do the activity with jars
The website that you had to ask questions about the sun.
I don't know
I wish the student's could have gotten involved with the lesson and demonstration
it didn't go far enough into the studies of these things
The clean up
I don't remember
I didn't like any of it
messing up (thinking one thing when it means another)
I didn't like the assignment.
The writing that we did.
I think it was a little too easy.
the muscles section
I liked most of it
I thought it was all interesting.
It was a little easy and boring. It didn't make you think too hard.
I liked everything about this lesson.
Seeing Mrs. M break the bone.
The worksheet
The chicken skin
Nothing.
nothing.
the chalk
nothing.
work
need more visuals
enjoyed everything.
none
didn’t like any didn’t understand anything
Going outside when it was cold.
The bone I don’t like bones
homework
Sitting there doing nothing
I liked it all
Making lists of information
learning about the skin

Did not like assignments, they were hard
skin
Chicken Skin
It was boring
Listing the characteristics, Learning things I already knew
just listening & not getting to do activities
I liked everything
We didn't get to do the cutting or anything, we just listened.
nothing really, everything was fine
everything else
I did not like the questions
That we had to write / answer question on a sheet of paper.
answers
That we had to answer a lot of questions.
How you can get diseases if you leave a cut open.
I could not understand some of the questions.
When we were comparing them. I knew a lot of it.
I didn't like looking at the chicken skin.
Comparing the bath tub to a human body.
The homework
using real chicken parts
examining bones that were soaking
The worksheets.
The homework sheet, because it confused me a little.
The skin was a little gross
I didn't enjoy it very much, it didn't keep my interest.
comparing so many different items
It took a long time to soak the bones.
There was not site
It wasn't very interesting.
collagen
We could have used hand outs
It was confusing.
I don't know
That I learned about organisms because it was confusing.
I did not like the chart we had to do.
I did not like that the questions were easy and it did not take very long.
the bath tube experiment thing
Actually, I liked all of it.
What I liked least is the paperwork.
How I was grossed out because of some of the parts.
Everything
I guess, if anything, I wish it was more of a hands on activity.
Studying the bones in general.
I hated how the move and they are alive because it is really creepy.
When we were talking as a group, it was easy but when we looked at written information, it was hard.
When my teacher broke the bones of the chicken.
I liked everything
I didn't like how short it was
I liked everything
Nothing was exciting
I liked everything a lot and didn't dislike anything.
The worksheets because I don’t like worksheets
I liked everything
I disliked some of the big words. It would have been easier if there were smaller & more understandable words.
I liked least about skin and paper
What I liked least about this is, it sometimes could be a little confusing.

Lesson 2:
What Makes Bones Strong?

Lesson 2: Teacher Results

Table 18.
Lesson 2: *What Makes Bones Strong?* General Questions

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson contained an appropriate amount of content.	0	0	0	0	77.8	22.2	5.22	.44
2. The lesson promoted thinking, inquiry, and study skills.	0	0	0	11.1	55.6	33.3	5.22	.67
3. The lesson was engaging (that is, it got students more interested in the science content).	0	0	0	11.1	44.4	44.4	5.22	.67
4. The lesson took an inquiry-oriented approach.	0	0	0	11.1	55.6	33.3	5.22	.67

Comments:

Excellent choice for bones (pasta) and collagen/minerals (rubber bands.
The concept developed from the pasta activity (collagen bundling) isn't emphasized in the rest of the unit, or lesson. It takes a fair amount of time, tools, yet the concept does not seem to be that important to the lesson.
I didn't think that the students would grab the concept, however they LOVED IT! They understood that the bands (collagen) help support the pasta (bones).

Table 19. Effectiveness of Lesson 2: *What Makes Bones Strong?* Materials in achieving Learning Outcomes

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. Students should recognize that there is a relationship between the structure and function of bone.	0	0	0	0	55.6	44.4	5.44	.53
2. Students should be able to describe how minerals, collagen, and stress affect the strength of bone.	0	0	0	0	55.6	44.4	5.44	.53

Comments:

Students were amazed at the difference in the strength of the "bundled" and "unbundled" bones. A powerful activity.
The vinegar and bleach demonstration were good. Students could appreciate the role that collagen and minerals play.
A great deal of teacher prep was needed for this unit. Pasta bundled prior to class because students broke the pasta when they attempted to bundle it themselves. The bones had to be soaked prior to lesson. Might be beneficial to highlight the information on things that need several days preparation.

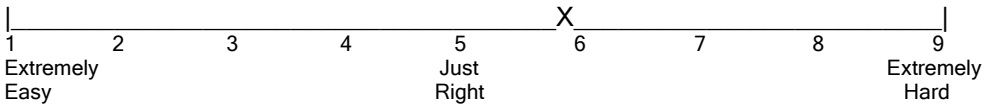
Table 20. Effectiveness of Activities in Lesson 2: *What Makes Bones Strong?*

	Very Ineffective 1	Ineffective 2	Mod. Ineffective 3	Mod. Effective 4	Effective 5	Very Effective 6	Mean	Std. Dev.
1. Overall, **Lesson 2: *What Makes Bones Strong?*** was	0	0	0	22.2	44.4	33.3	5.11	.78

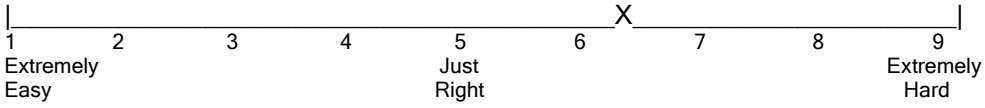
Comments:

Students really were "into" the activity. I was pleased with the “bathtub" writing activity. Nearly every student was able to make valid connections.
The bathtub analogy is a good one. Students appreciated the diagram. The homework assignment seems to ask the wrong question. The idea that bones were "alive" had already been established. Perhaps a better question would be: "How does the bathtub analogy represent how bones change a person's lifetime?"
The students remembered the collagen bands at the end of the field-test!
The students learned a lot about bones but were confused with the role of osteoblasts and osteoclasts and therefore did not understand well the bone in balance bathtub.
If our weights had worked properly the lesson would have been great. Time was a big factor.

Lesson 2: *What Makes Bones Strong?* Difficulty for the Student as Rated by Teachers. The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 2 difficulty mean = 5.78, std. dev. = .83.



Lesson 2: *What Makes Bones Strong?* Difficulty for the Teachers (i.e. preparation, delivery, etc.). The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 2 difficulty mean = 6.22, std. dev. = .67.



Comments:

It took some time to boil the chicken to get the needed bones.
The pasta activity probably needs changing. Is it really worth the effort?
I enjoyed watching my students "figure out" how they should design the experiment. I was pleased that they made sure they kept both strands next to each other, added weight, measured, then continued to add weight.
Finding small rubber bands was a challenge.
I was ok once I found the weights! Using washers was helpful! Thanks!
I would have shown the "pasta" bridge to the whole class at once. Too much time was spent passing out material, stacking books, adding weights. The class ended and we had to collect materials for the day and then pass them out on the next day. It was not worth the amount of time put in to it. Would be more valuable as teacher demonstration.
The lesson used difficult terminology and concepts for my students (sixth grade). Also, the delivery of the activities is somewhat "artificial" because there is a lot of reading directly from the script. The angel hair pasta activity was great in demonstrating the effects of collagen on bone.
More time was needed to complete the lesson. We had to improvise on the weights in order for the tests to work properly. If you have only 45 min. for this lesson I recommend doing it as a demonstration. Pasta broke easily when students attempted to group the pasta themselves. Tried it as a demo with one class and it worked well.

Table 21. Total Number of Class Periods spent on Lesson 2: *What Makes Bones Strong?*

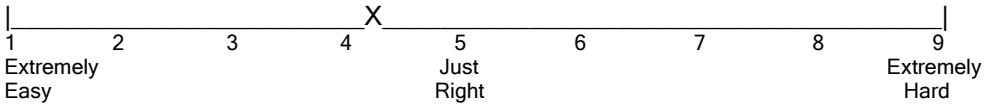
	1	2	3	4	5	Mean	Std. Dev.
Class periods spent on Lesson :2	22.2	55.6	22.2	0	0	2.0	.71

Lesson 2: Student Results

Table 22. General Questions on Lesson 2: *What Makes Bones Strong?*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson was interesting.	1.8	2.3	6.9	22.1	39.6	27.2	4.77	1.10
2. I could read the material easily	0	1.8	5.7	21.3	46.5	24.7	4.87	.91
3. I could understand the examples and explanations.	0	1.0	5.9	18.6	44.1	30.4	4.74	1.03
4. The lesson made me think about new things and questions.	4.1	5.9	14.4	25.2	33.7	16.7	4.02	1.40
5. I could understand the scientific information easily.	1.5	2.6	9.3	21.3	40.4	24.9	4.71	1.11

Lesson 2: *What Makes Bones Strong?* Difficulty.
The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the students to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 2 difficulty mean = 4.19, std. dev. = 1.51.



Student Comments on Lesson 2:

On the scientific information, we need to know or they should explain it more to us on paper.
It was great!
Overall, this lesson was good. Letting kids get the pasta wet would keep some kids pay attention.
Most of the things I could do.
The pasta didn't bend much when we put the weight on it so there wasn't much difference between the different pasta bunches.
It was a creative lesson
This was a fun study
It was very awesome with the hands on projects
Some was ok some was interesting~bones~not bath tub thing
Some of the teaching examples were at times hard to follow
I thought that the lesson was okay. It was easy to understand but it did not make me think about new things really.
Easy
The examples with bones were nice.
I have never seen collagen shown or represented using pasta and rubber bands, offering a new experience.
I really enjoyed this lesson.
Examples were cool

Very interesting visuals
It was interesting
It was really easy to understand the information.
The activity was fun
the lesson was great!
This lesson was one of my favorite!
I liked the activity with the rubber bands, pasta and the weights.
I liked this lesson, but I really kind of knew it all.
This was fun!
The idea of using the noodles was cool.
no
I couldn't understand the scientific information easily because it wasn't very clear to me.
Good Lesson
I could read all materials as easily.
It really didn't show me any new things.
I had hunger pains from looking at the pasta
This lesson was fun and interesting.
Add a website page

What did you like most about lesson 2?

It was about how minerals and collagen lead to a healthy bones
I liked when we had to use the pasta and rubber bands to describe the bones and when they explained to us the use of meat, fat and bones.
I liked everything about this lesson
I liked this lesson because it told me what to do to maintain healthy and strong bones.
I liked the exercise that we did with watching the chicken bone broken in two parts and answered question about it.
I liked doing the projects.
Learning how the blood was released from the bones.
because we got to work together
I liked mostly was guessing which sport was more helpful and it was running.
I liked that we got to compare living things to non-living things.
I liked when we worked in groups with the pasta.
I liked the bones because they get strong when you drink milk.
I liked everything about the lesson! Especially when we used the pasta and rubber bands.
What I liked most was it was easy and I learned new things.
The experience was okay.
When we used the pasta and rubber bands to help us understand how minerals and collagen contribute to healthy bones.
Getting to see how the spaghetti turned soft.
I liked how they showed picture of collagen so we could see what it looked liked.
I liked using the noodles as an example, it made the info easy for me to understand.
Watching the spaghetti hold weight.
When we looked at the bones.
It was cool hanging scissors off the pasta and looking at how the change being in water overnight.
I liked how we saw the spaghetti molded together to look like bones.
There was some active experimenting that I got to do
We got to eat raw pasta
How the pasta that was in vinegar was very brittle!
I learned a lot about collagen and things relating to bones.
It was cool how the pasta changed when it went into the water.

I liked wetting the spaghetti and looking at it when it dried.
The pasta experiment.
It was really interesting and full of information
I liked using pasta and testing how strong it was like real bones with more calcium.
The pasta experiment.
The orange juice and milk test sheet
The examples were cool
I liked doing the spaghetti experiment.
It lead into other experiments (we need more experiment starters)
Seeing what the pasta would do
The pasta and bone part
I liked the chicken bone soaked in bleach which made it bright white.
How much the bones changed when we soaked the pasta in water.
I liked how the pasta fused together.
It had visual teaching style
I liked looking at the pasta when it was all stuck together.
I liked the hands on activity
I learned what collagen was and how calcium was a big part of bones.
Putting pressure on the pasta.
Making the pasta / spaghetti thing
Experimenting with the spaghetti and putting weights on it.
I liked watching the experiment instead of reading from a book.
It was pasta!
I liked seeing what happened to the spaghetti when you added things onto it
The materials
Seeing how bones and noodles are similar
I liked the spaghetti experiment. It was good way to explain how without a certain mineral bones can fall apart.
Well, I had the idea that we're always adding out something new or taking away.
Seeing how it makes a difference with rubber bands.
This was fun and the studies gave it life.
I liked the pasta thing
The noodle example
I liked watching you break bones

How the pasta baked when it was soaked in water and then dried.
I liked seeing how the water affected the pasta.
The pasta experiment.
Pasta, it was quite interesting
I liked everything about this lesson
Got too do the activity with weights
Make the model
That we all had groups and it was fun.
When we used the pasta and rubber bands and attached the weights to them.
Putting weights on the spaghetti
Having to make noodles
Everything
The rubber band thing
The time examples
I liked learning about how the bones moved.
The bendable bone
The bones are flexible
The bones in vinegar/bleach/water!
No quiz and the computer project
Seeing the difference between the bone in vinegar and water
I understand it!
I learned lots of things that will make me take care of myself more.
I liked the vinegar bone thing
I loved the ideas in this lesson it made me understand a little better.
It was fun and exciting
Learning about bones
I enjoyed learning about what the bone was made of and what the minerals and collagen do.
Bath tub and bones
Seeing the spaghetti with rubber bands not flex as much as the spaghetti without.
The examples and the pictures helped.
I liked learning about the bones and what's within them.
Learning about what really happened and seeing visuals
I liked the muscles moving
The examples
We got to feel different kinds of bones and we discussed a lot about it and I got to understand it.
All the chicken bones and straws that you used as an example
I liked how you did the examples (with the bones and the pasta)
The visual and how it was a very good relation between bones and spaghetti and the bath. It was easy to understand and related the two.
The part when he put weights on the spaghetti strands to see how strong they were.
I liked soccer kick
How the spaghetti with the rubber bands could bend more easily than the spaghetti without the bands.
The visual (watching the pasta bend)
Learning that minerals and proteins in bone counter balance each other.
Learning about how the minerals come and go (grow & shrink) and the bath tub theory.
The bone in the vinegar experiment.
The examples of the bones that could and couldn't bend
How he used the bath tub analogy, he explained it to me well.
When we were shown the difference between pasta wrapped in rubber bands and the pasta not wrapped. I was partially surprised to see that the rubber bands made the pasta bend less than the unwrapped pasta.
Learning about collagen
It was cool to see the examples, especially see the bone really bended and flexible
The complexity of bones
That we got to see through pasta, what our bones were doing.
I liked learning about what happened to bones without collagen or calcium (seeing how hard/easy the bones broke)
The experiments

The example of the bone without minerals.
I enjoyed learning what the bone was made of and what makes it flexible
Interesting
The examples caught my eye
How the lesson stayed interesting, not boring
The flexible bone was cool
I liked that we could actually see the different bones in the vinegar and with them bending than breaking. It made me understand more.
Going to tech lab
Transparencies, experiments
Spaghetti / Bone
The eggs
The eggs and spaghetti
The computers
The example with the angle hair noodles and weights
The experiments
It went quickly, not slow
It was cool
The examples
The diagrams of bones
The bundles of collagen experiment.
Testing the weights on the pasta.
Visual, explanation and hands on
The hands on demonstration
The eggs with bleach and vinegar and what the vinegar is doing to the egg and the water and oil with the noodles on how much they bend not bended and when bended.
Learning about the eggs and the calcium thing.
The experiment!
Learning what are bones are made of.
The eggs
That we got to look at stuff
I liked the experiment
Looking at all the different thing that happened to the eggs.
The eggs experiment
The eggs were cool and learning about the egg shells.
The demonstration
The egg experiment
Egg examples
Kicking stuff around
The thing with the eggshell
The part with the egg shells
The spaghetti noodle thing and the eggs.
The demonstration
Looking at the chicken eggs and weight on the pasta sticks.
Learned about calcium
The eyes
I liked the demonstrations
Learning about chickens and eggs because I've always wondered about how chicks and edible eggs were different.
Noodles and chicken eggs
The eggs
The eggs and pasta noodles and overheads to help us understand. I liked the examples.
Examples, eggs and angel pasta
Spaghetti bones with weights
I liked the angel hair experiment
The experiments
The activity of seeing how much weight a group of pasta rubber-banded together could hold. Then how much weight those pasta could hold.
weighing the noodles with washers
no homework
activity
I liked when we used the pasta and rubber bands, it gave me a vision or an explanation.
breaking the spaghetti
The poster

I liked putting the weights on the pasta
Putting weights on the spaghetti
experiments
I liked the experiment because I could see how bones are healthier with minerals & collagen.
the project
Using all the materials experimenting
Playing with the pasta and seeing how strong the pasta
the activity
We learned about bones and what makes them healthy.
We got to experiment with partners so we each got to be involved equally.
When we got 2 learn what makes bones stronger
doing the pasta and weights experiments
How the pasta got stronger with the rubber bands
When we put the washers on the noodles
When we put the weights on the noodles
How we learned that with extra help with materials makes our bones stronger, it was fun.
Spaghetti
It was interesting when we put weights on the pasta
Hands on
The pasta project
I love the pasta weight thing
the pasta & rubber band experiment
The activity
testing the strength of pasta
the activity
I like bones
No homework
Putting the weights on the spaghetti and seeing how much stronger it was when it was in a bundle.
trying to put as many weights on the pasta as possible
experimenting with the spaghetti
the activity
It was fun, the class got into it and had fun. This lesson could use a little improvement.
putting the weights on the pasta
When Brian Barett broke the chicken bones
seeing how long the pasta held the washers, plus seeing how many washers the pasta could hold
Using the pasta and rubber bands model.
the experiment, because we worked in groups
When we used the pasta and rubber bands.
The pasta stuff
Using the pasta as a bone
When we got to see how much weight the pasta could hold.
It was Buena (good).
The pasta tasted good!
not much homework, the activity
learning what make bones stronger
Model of the stuff like & not like
the spaghetti activity
Putting the pasta in rubber bands and then putting the washers on them.
The examples of weights, rubber bands and pasta to represent bones, calcium and collagen.
that we did a project in groups
learning about calcium
The experiment
hanging the washers from the two bundles of noodles & seeing which one broke first
Putting washers on the pasta
The experiments in this less was fun!
It was fun
Putting weights on the pasta with rubber bands and without rubber bands around pasta
Again, the activity & project
The noodles and weights
what we did with the noodles

I liked about it was when we took the pasta that was bundled and added collagen to it to see if it was stronger and unbundled we did the same thing.
using pasta & the weights
I enjoyed the pasta, rubber bands and weights
Doing the activity
You it was interesting
how we got to be with partners when we had class things.
you could lose weight
The pasta experiment.
The experiment. I enjoyed the hands on experience.
putting weights on the pasta and breaking the pasta
the activity
The experiments
we got to use pasta sticks
The experiments
The fun interaction that we all got to do. That made what she was talking about easy to remember.
Bone experiment
The activity with noodles, it was fun!
Pasta experiment
The activity
When we learned what takes collagen out of bone with the chicken bones
noodles
testing the noodles with the washers that was fun.
When we did the spaghetti
How there was a fun activity
The spaghetti noodles were tasty
Learning how to keep your bones strong
The pasta
The spaghetti
It was all a fun lesson
the activity with the rubber bands and the pasta
The experiment with the spaghetti
The pasta and weight experiment
The in class project, the pasta
We did an activity with noodles
watching the pasta stretch and break
The pasta weights
I liked breaking the pasta
It taught me how to take care of my bones
The activity
When we put the washers on the pasta and saw how many it could hold
Again, it was interesting and easy to follow. It was also fun.
seeing the way our bones are with pasta
Bones in jar
The spaghetti and the weights
I liked when we did the experiment with the pasta
I liked working in a group and testing the strength of the "bone". I thought that the bath tub was a good comparison.
I liked putting the weights on the spaghetti.
Seeing and actually getting to do this experiment.
seeing the pasta and seeing how strong it is.
I wasn't here for this neither.
The pasta experiment.
It was very interesting when we did the experiment.
Testing the pasta
When we put the washers on one by one.
Putting the weight on the paste
learning
test
Doing the activity with the noodles and rubber bands
All
The noodles and weights experiment with rubber bands it was fun and helped learn.
Seeing everyone's projects
Putting all the pasta together
When we got to see how strong your bones were with calcium and

nutrients by testing rubber bands with pasta
No homework or very little
the model
The pasta experiment.
Working in groups and working on the activity
to see how much weight the spaghetti could hold
the soaking bone activity
comparing everything
testing how much weight was held
breaking the pasta
Bone snapping and ect
Seeing when the pasta would break
activity using noodles like a bone
How the bones feel and how they are different
When they were passing out the bones
I like when we had to feel the bones and when we did the experiment with the spaghetti
When we did things with the spaghetti. Things are always more interesting when we do stuff other than just watching.
The experiment about collagen.
The experiment we did
that we got to do small experiments
How the bones works
I like the examples and the information
I liked the simple examples
That we got to use our hands, (experimenting on bones, books and spaghetti examples)
the questions about the bones.
We got to see pictures of bones and we got to see real bones.
Learning about what the cells do in the bone.
Testing the pasta and rubber band.
When we made the pasta to represent a bone.
The spaghetti was my favorite.
Doing the experiment.
When we took the pasta & put the weights on them.
That bones need collagen and calcium to stay strong.
using other materials, not just a science book.
Doing the experiment.
Pasta & rubber bands experiment
I liked the part with noodles and rubber bands
The hands on project.
The experiment
You could see how much the pasta could hold.
I liked comparing the pasta to bones.
learning about skin, muscle and bone
I got to learn about new things.
Looking at the different things and comparing them.

the pasta and how it is used to weigh things
It was informing to find out how healthier bones are stronger than others.
The good examples
Worksheet because I am lazy
Working in groups and also using the pasta
learning about calcium
I like everything that we learn in this lesson
I liked when we learned that we needed collagen and minerals in our bones.
I like most that it reminded me that not only do humans have to take care of bones, but also other animals.
The examples and experiments.
Mostly everything was understandable.
Everything
I liked the example of the bath tub.
When we did the experiment on bones with the pasta.
I liked testing the noodles.
How bones get strong and what makes them strong.
Learning about bones and the experiments.
Using the pasta
Was when we learned about the Ostioblast and Ostioclast the making & destroying of it.
I got to learn about new minerals, I never knew what made bones strong.
How could I like this lesson, we didn't even get to make the spaghetti and rubber bands.
How they have spongy tissue inside the bone.
That your bones are very strong and you have minerals on your bones.
When we put the pasta between the tables and they broke.
To find out exactly what calcium can do to the bones.
I liked the example
I liked everything
The experiment
you could see the weights pull down the pasta
I thought it was easy to understand.
Making the noodles support the weight
The pasta
It was fun and easy
I liked the way we had to compare the bath tub with osteoblast & osteoclasts.
Experimenting with the noodles.
What I liked most was how we got to use examples to help us understand it better.

What did you like least about Chapter 2?

Nothing, I enjoyed everything.
I liked everything.
I liked everything about this lesson
I least liked the reading.
I found that I least liked about the blood being in the bones
I did not like when Ms. Holland picked up that chicken bones and we saw the minerals on it.
I did not like that it wasn't very challenging.
What I liked the least was when the bones break, you can't use it until it heals.
Nothing
I do not have nothing to write because I liked everything about this lesson.
The lesson was easy because we only have to identify the object if it was alive.
Nothing
Nothing
No comment.

I liked everything
It took a while to count the right number of pieces of pasta to fit tightly in the rubber band.
Not very much active stuff to do.
The smell of vinegar!
I liked everything fairly well.
Watching the teacher do it.
It was a little hard to follow
Nothing really
I liked everything
Hard to say
The part were we talked about bones.
Nothing It was pretty fun.
I can't remember
Nothing
Nothing
The vinegar did not work as well as I thought.
Reading the plan.

Having to learn about what else was in the bone other than calcium.
It was boring
I did not like how there wasn't much different strength of the different bunches.
It was monotonous
Not sure I liked it
Nothing really, it was all fun
I did not like the different bones because why would you put your bones in vinegar.
It's just a preference, but the killing of rats makes me sick.
It was ok
I liked everything about it.
It didn't seem real
It made me hungry!
Write reviews
Nothing to say, I liked it.
It was hard trying not to break the pasta before we did the experiment.
The model
When we had to read
Having trouble holding the pasta up
I liked the project
It was fun
The raw chicken skin
The bath tub thing
Nothing
The bath tub example
The bath tub
Nothing
It was too confusing
It was long and boring
There was nothing I didn't like
Nothing, it was cool
Nothing
I liked it all.
I loved it all.
Not being able to see the example
More information and notes.
Some of the topics were hard to understand.
It was slow
How nothing was interesting
It was hard to understand, all the bones and what they're made of.
We didn't spend very much time with it.
Nothing
I thought that most things were interesting overall.
I wasn't all that explanatory
I liked everything
I liked everything. I really didn't like anything.
We didn't get to help
N/A
Learning what the bones was made of.
The spaghetti was weird.
I didn't like the computer project as much.
I enjoyed every part of the lesson and thought it was fun and interesting to learn the material in such a manner. So, I really didn't dislike any part and deciding which part I disliked the most would be close to impossible.
Nothing, I thoroughly enjoyed this lesson.
The examples
Once you figured out what was going to happen, the examples went right over my head. I did not like the kicking thing.
That the website was difficult
I didn't like the kicking activity
The overhead didn't seem detailed enough
The computer project
I didn't like the fact that the information was kind of unclear
Moved fast
I didn't really understand what the bone looks like were calcium B and so forth

Same as other side
The smell, I guess. Overall, good lesson
The diagram
Not having hands-on experiments
Sitting
Writing
Kind of hard to hear so I don't think that I got it all
All we did was listen to the teacher
Nothing
Didn't have hands on lecturing
The overhead bath thing.
We didn't do anything with our hands we just watched.
Nothing
Overhead is boring.
It covered some stuff I already knew.
I liked everything, it was fun.
There was a lot of things in this.
I loved the lesson, it was fun to learn about that stuff.
Looking at stuff on the screen
Nothing
Nothing
Nothing
The overhead pictures.
The spaghetti part, it should have been cooked.
Nothing, everything was cool.
More interaction
Writing and thinking
I least liked that we could not do anything with our hands.
Nothing, but we should watch movies! Like Bill Nye
Listing things about bones, muscles and skin.
We only got to test each once. We could have experimented with different lengths between the books or the size of the pasta, or the amount of rubber bands.
homework
homework
Nothing, I thought it was great.
it was complicated at times
When we did worksheet
When the pasta broke
when the spaghetti broke
This was my favorite lesson, I liked everything.
nothing, it was all good
didn't find anything I didn't like
not very interesting
It had a lot of worksheets
I wish we could have experimented a few more times.
The clean up
I liked it all.
For me, lesson two was the funnest, I enjoyed it.
Clean up
Need more examples
I think I mostly liked all of it
When the pasta broke
writing down the results
the activity
That it was hard.
I don't remember it all
Don't remember
After the hands on fun part, you just sat back down and listened. It should be taught during the fun part.
that I didn't break any bones!
I loved it all.
the part were we have to fill out the stupid survey
When they broke and we had to pick them up
Don't know
homework
there was some homework
not sure
Sometimes the experiment turned out that the unbanded pasta was stronger.

we only had two days
Collagen
all the information
Putting the rubber bands on the noodles
When the pasta broke
I didn't like having to do the experiment over and over again because the spaghett wouldn't break it just fell off the books.
It wasn't very fun
I liked least about it was the lessons.
the tube worksheet & what does the water stand for
I liked everything!
Getting the mineral names into my head
we had to write stuff
I wish we would have done more on the website
I liked it
I enjoyed it all.
Nothing. I found it entertaining.
bring all our books to class
the internet site
Cows
it was a mess to clean up
Don't know
I thought this lesson was informative but easy!
When we took notes
homework
I liked it all.
having to chart the heights like if the washers would make the noodles come down….didn't like to chart that.
I don't know
It was kind of hard to get it set up
When the pasta broke
Picking up the pasta after it broke
The clean up
didn't find anything I didn't like
I don't know
ruining good pasta
Don't know
Now I can't always have pop
The essay at the end
It didn't really challenge what I already knew
I liked it all.
I liked it all.
I thought this lesson was really fun. I thought it was the best lesson….there wasn't anything I didn't enjoy.
I thought this was a good lesson but it was EASY!
Nothing.
I liked it.
learning about the mineral in bones
Nothing
not much else to do
Cleaning up the mess.
Breaking the pasta
worksheets
nothing
I liked everything
none
the explanation paper we did on it.
Doing the project
The pasta keep breaking
We had to write a lot.

sitting there doing nothing
I can't think of anything.
picking up the pasta
spaghetti activity
this lesson was not interesting
It smelled
Charting the information, learning things I already knew
writing how bones are like bath tub
I liked everything
The after smell from the bones on my hand
The worksheet that is for homework. It's kind of confusing.
doing the evaluation charts
the other things
The scientific words is the least favorite of this lesson
The scientific words
That we had to relate some things to the bones.
How the bones dies.
The questions.
all of the stuff was a little obvious & common sense to know.
I didn't like how many books you had to use to get up to 20 cm.
Doing the homework.
I did not like the homework sheets that we got.
The experiment didn't really show a lot of information.
the pasta didn't really move
Counting the spaghetti.
I dislike the worksheets on the lesson
Looking at the bones that were soaking on the different liquid.
The mess after if the pasta broke.
I didn't like looking at the soaked bones.
the paragraph about the bath tub model.
It did not show very clear results
I wish we could have talked about it more or shown better examples.
Collagen
The inconvenience of not knowing some of the definitions
Nothing, I enjoyed it all.
I don't know
About the collagen because it was hard.
I did not like that I had to read the directions for the experiments.
The questions were a little too easy to figure out, but I do comment that it does teach a lot.
What they tried to prove.
I did not like the pasta and rubber band experiment.
Actually, I liked all of it.
How I didn't get part of the experiment.
Everything else.
I had no problem with this lesson.
Nothing, except the fact that we didn't make anything in the lesson. Only the other class got to.
I did not like how they did the model of the pasta.
It was a little complicated.
When we had to clean up the pasta
You really know if bones would react the way
I liked all of it
The worksheets
I had no disliked
Nothing, loved everything
It was harder to understand what everything meant

Lesson 3:
Anatomy of a Kick

Lesson 3: Teacher Results

Table 23. Lesson 3: *Anatomy of a Kick* General Questions

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson contained an appropriate amount of content.	0	0	0	0	77.8	22.2	5.22	.44
2. The lesson promoted thinking, inquiry, and study skills.	0	0	0	0	44.4	55.6	5.55	.53
3. The lesson was engaging (that is, it got students more interested in the science content).	0	0	0	0	11.1	88.9	5.89	.33
4. The lesson took an inquiry-oriented approach.	0	0	0	0	44.4	55.6	5.56	.53

Comments:

Program was excellent!
The students really enjoyed this lesson.
The class was very involved and discussed many other ways muscles work to provide movement in our body.

Table 24. Effectiveness of Lesson 3: *Anatomy of a Kick* Materials in achieving Learning Outcomes

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. Students should be able to explain that muscles produce movement by contracting.	0	0	0	22.2	33.3	44.4	5.22	.83
2. Students should be able to explain that muscles are attached to bones.	0	0	0	0	44.4	55.6	5.56	.53
3. Students should be able to explain that opposing muscles or groups of muscles produce movement in opposing directions.	0	0	11.1	0	44.4	44.4	5.22	.92

Comments:

Having the different views of the muscle movement helped illustrate the concept of: muscles contract to produce movement; muscles work in opposite groups.
The website may be expanded a bit. It seems that the site could include some analysis of how the muscles move the legs. It is already in the program, but it could also develop the idea that muscles must connect to bones.
(Arrow pointing to number 3 above) Very difficult concept. Only pointed out, at the beginning w/the bicep. Perhaps if you provide a skeletal diagram so the students can draw in the bicep/triceps to visualize opposing muscles.
This lesson took longer than 1 class period because we had to go to the computer lab for the web component. Some students completed the task much faster than others. The dinosaur component had to be competed during the next class time.

Table 25. Website for Lesson 3: *Anatomy of a Kick*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The students were able to navigate easily through the website without confusion.	0	0	0	0	44.4	55.6	5.56	.53
2. The website aided in comprehension of the lesson.	0	0	0	0	11.1	88.9	5.89	.33
3. The website made the lesson interesting for students.	0	0	0	0	11.1	88.9	5.89	.33

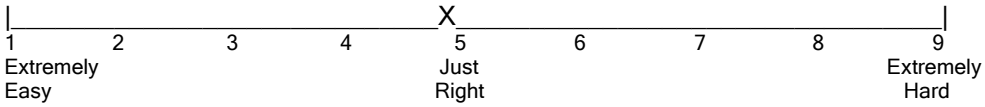
Table 26. Effectiveness of Activities in Lesson 3: *Anatomy of a Kick*

	Very Ineffective 1	Ineffective 2	Mod. Ineffective 3	Mod. Effective 4	Effective 5	Very Effective 6	Mean	Std. Dev.
1. Overall, ***Lesson 3:*** **Anatomy of a Kick** was	0	0	0	0	33.3	66.7	5.67	.50

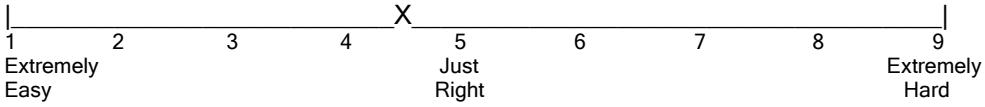
Comments:

awesome!
Some students just guessed about the order.
Students were engaged, and determined to pass the test.
Very effective in teaching the objectives. Some students were still a little unclear about the opposing pairs.

Lesson 3: *Anatomy of a Kick* Difficulty for the Student as Rated by Teachers. The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 3 difficulty mean = 4.89, std. dev. = .60.



Lesson 3: *Anatomy of a Kick* Difficulty for the Teachers (i.e. preparation, delivery, etc.). The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 3 difficulty mean =4.44, std. dev. = 1.59.



Comments:

Had trouble with the web site address but once we figured that out, no problems. I liked the lesson but I think adding the dinosaur activity at the end caused some confusion. Since we give the example of an outstretched arm, perhaps a simple diagram with connection points for the muscles in the arm would familiarize the students with making the dinosaur connections at the end of the lesson. (*Mark and I discussed this at length.)
One class had to endure difficult viewing conditions of a projected website due to internet access problems. (1st period)
The kids readily understood what to do on the website. They liked it very much. They liked to see the "goal" appear for correct responses.
It is difficult for me to read from a script. The Anatomy of a Kick website was helpful in developing the idea that muscle work in pairs and that no movement occurs in the body without muscles. Also problematic was that we could not use the computer lab for this activity. We were able to access the website in another building and on only one computer.
Students enjoyed this lesson a great deal. We did find that 2 combinations of letters gave a correct response. I think students would have liked doing another similar web activity.

Table 27. Total Number of Class Periods spent on Lesson 3: *Anatomy of a Kick*

	1	2	3	4	5	Mean	Std. Dev.
Class periods spent on Lesson 3	55.5	33.3	11.1	0	0	1.56	.73

Lesson 3: Student Results

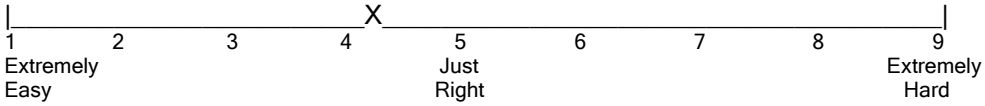
Table 28. General Questions on Lesson 3: *Anatomy of a Kick*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson was interesting.	2.6	4.9	10.1	24.4	36.3	21.8	4.52	1.22
2. I could read the material easily	0.5	1.6	6.5	21.6	42.9	27.0	4.86	.98
3. I could understand the examples and explanations.	0.3	2.1	8.7	26.3	35.3	27.4	4.76	1.03
4. The lesson made me think about new things and questions.	6.0	8.6	15.9	28.1	26.0	15.4	4.06	1.39
5. I could understand the scientific information easily.	1.8	4.2	10.4	24.2	35.6	23.9	4.59	1.18

Table 29. Lesson 3: *Anatomy of a Kick* Website

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. I was able to navigate easily in the website without confusion.	1.1	3.7	5.6	13.2	35.2	41.3	5.02	1.13
2. The website helped me understand how to conduct scientific investigations.	3.4	5.5	10.0	26.4	29.8	24.8	4.48	1.30
3. The website made the lesson more interesting.	2.6	3.7	6.9	17.2	28.3	41.3	4.89	1.27

Lesson 3: *Anatomy of a Kick* Difficulty.
The scale used for the difficulty of each lesson line across the page with three easily identifiable equidistant points for the students to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 3 difficulty mean = 4.20, std. dev. = 1.70.



Student comments on Lesson 3:

It was really fun
It was great!
It was kind of boring at first.
Except for the fact that we did not use computer!
Not available
This was easily my favorite one because it involved a computer. In my opinion computers really improved the lesson.
I did not navigate through the website
I was not sure about this lesson.
Great website
The website confused me more than helped me.
It was really cool to watch what was going on.
We did not go to the website individually and the teacher projected it onto the white board.
It was fun, but weird how the muscles don't go in order down
The website was good showing the muscles contracting, but it was still boring.
On the kick, I didn't like it because it didn't show any names of muscles.
Easy
The website made me think about how my muscles

worked to move my body
This was very fun and unique
They should have shown all the muscles moving together
The website activity was hard to figure out!!! I couldn't find the answer.
The website wasn't the most interesting thing. The test was fun.
The website was really interesting
because I already know how to conduct scientific investigation. I think that they are really easy.
That without the website, it would have been boring.
It was very confusing when we had to type in questions because the results were difficult to understand.
The website made the lesson much more interesting. I enjoyed it because we were exploring & expanding our minds on our own.
The website could have taught more.
The website really helped bring things together!
The site was very interesting. You should do something like that for each lesson.
No comments, perfect
Ok

What did you like most about Lesson 3?

I liked how the investigation shows how the muscles attached to the bones and contracts to allow someone to kick a ball.
I liked when we used the website and saw the man kicking the ball and we did the test on it.
I did not know that you had to use a lot of your bones to kick a ball. I thought you just use your knees, legs and foot.
I liked the part were we chose which bone moved first.
It teaches me how the muscles move in your body while your doing a movement or when you are walking and which muscle move.
I liked playing that game on the website
I liked the website
Watching the bones work to help the person move their arms.
What I liked about the lesson was that we got to go on the internet.

When we got to play the guessing game to see which muscle he used first.
I liked that it was very challenging.
I liked it when we went on the internet site.
I liked it when players combine muscles and bones to kick the ball really hard.
When we went on the computer and saw the figure kick the ball and when we did the thing with dinosaur.
What I liked about this lesson is we got on the internet and played with the man kicking but at the same time we were learning.
That we got to see the muscle and bones and how they work, move and we got to figure out the part were we have to put letters and the model help us to figure it out.
When we were on the internet.
Getting to see the figure move after you figured it out.
The website was fun to use.
Demonstrating demo thing

When we had to figure out the order
I liked watching the skeleton kick on the website.
I liked how I was allowed to go on the internet.
The website was very interesting.
Making the guy kick the soccer ball.
How it had the computers involved.
The website
The website made it easier to understand
I liked doing the thing were the guy kick the soccer ball.
I liked labeling the order
The website
The website was a good thing to have.
I liked learning about how muscle attached to the bone.
The web page
Finding about how you use the website
The dude kicking the sphere
The kicking man on the internet
Watching the diagram
It taught me with a game or puzzle.
Playing the game on the website
The website
I knew the functions of all muscles when someone kicked.
The website
Seeing the skeleton more was cool and seeing the muscle man move was cool.
Going on the website and doing the combination.
Looking at the examples on the website and doing the quiz.
I liked watching the movie at the kicker and then trying to guess the order of the…
The colors
I liked the website when we figured out what would be next.
It was cool graphics
This was fun to see how the body moves.
I liked being out of the class room and in the commons.
I liked the website and how we did the paper were we attached the work.
Seeing the different muscles used to kick
Nothing!!!!!
When we checked out the website together.
Using the website
The website
It was cool
I liked the website. It made the lesson more interesting and easier to understand.
The website
Looking at a guy, kicking a soccer ball. It looked funny
The website
I liked going to the website
It was cool and fun
Got to go on the computer
That we did it on the computer
Went on website
I liked that the test was fun to do
Getting it right
Making the guy move
Being on the internet
Steps how to kick a soccer ball
All of it
When you filled in the right letters it set a goal and a crowd cheered. That was funny and cute.
Sort of a game
Examples

Watching the kicking guy
The kicking guy
The soccer player
The animation
The website
Figuring out which muscles worked
Being on the computer
It was fun
When the guy kicked
I liked the animation
I liked how they showed the muscles and moving and how they showed how the muscles coordinate together.
Watching the movie about the kicked
It was on the computer
Animal (rat)
Seeing all the different bones
I enjoyed the website, confusing though
I liked going on the website and watching what goes on in your leg when we kick the ball.
That you could see the muscles moving
The anatomy - kick website were you had to match the muscles to figure out what muscles you use to kick a soccer ball.
The animations
It was interesting and kind of challenging
How you got to see how a kid kick a ball and how all the bones move when kicking a ball.
I liked how it animated the person running and their kick.
I liked the visual it gave, it made it easier to understand.
Being able to do it on your own and at our own pace.
Watching the soccer kick video
The animations
Seeing the kick in real life and then just the muscles needed.
Computer program
Not really anything
The visual was helpful
The animated examples made me think and pay attention.
I most enjoyed going to the website and trying to figure out which muscle groups went where and what each group did.
It was easy to learn from and understand
It was very fun and it made me really have to use my brain.
Website
Working with Amanda
The graphics on the website
Working with Annie
The animation
I liked the website
I liked learning about what muscles we used to kick.
I learned stuff, I guess
The kick was very fun to create and learn about
It put it into a real life situation
Going on the computer
The website and actually seeing the body and the way it moves toward the ball.
Going to lab
Website, hands-on activity
Website
It was on the computer
Fun
It was different cause it was on the computer
Website

We used the computer
Website
The website
Website
Internet
It was on the computer
It taught you about how you use your muscles
Websites
Working with computers
Computers
It's hands on
The internet
The website
The soccer guy
Computer
The website
The website
The website
Everything
The computer lab
Everything
Got to use computers
Soccer player
The kick
I liked the website
Watching it kick the ball on the computer
I don't know
Website
Internet
Computer
Website
Going to the website
The skeleton on computer
The muscle test on the website.
Finding the right muscles
computer
Computers
When we went on the computer
the computer
The diagram it showed on the site
the website was fun, watching the man kicking a ball
figuring out the puzzle
the one line
Watching the soccer kicker & how he used his muscles.
the website
going online
seeing the guy kick the ball
you get to get onto the internet
I learned the anatomy of a kick.
You got to use the computers which is special so I remembered it more easily and learned more.
When we went onto the website and learned about how muscles work when y'all kick a soccer ball!
going on computers
How they showed us how your leg works
When we used the cows
I liked to find out the order of the bones
That we got to go on the internet and do experiences ourselves
Computer
going on the computers
using the site

Doing the project
The website
The website
The internet site was engaging
Using the website
The website
The website
That you learned lots of stuff
The website
trying to figure out which muscle worked first etc.
going on the computer
It was animated and on a computer, two things kids like.
using the computers
The cows (computers)
visiting the website
Going on the website was interesting
the website, I guess
when we got to go on the website and look at the muscle
The computers
Going to the website
When we got to see how the leg works.
The computers
The activity
When we got to go on the web
Looking at all the different views of a person kicking
How the skeleton and muscle man showed you exactly how they moved.
Computers
going on the website
going on the internet
Being on the computer
the website
I enjoyed being able to use a computer / internet to do research and learn more about muscles & bones.
We got to use the computer
getting on the website and taking the test
The website
computer site
The website
I liked more about it was when we went on the internet to do research, it was fun!
I liked the website
the website
how we got to see how the muscles worked & moved
Computer work
The website
getting on the website
very interesting
being able to see what bone were used to kick a soccer ball
we got to get on the computer
The outcome of sports exercise
On the website when we were able to see how the muscles worked in the leg.
computer
The website
website
The computer game.
when we tested our legs
being on computer
The website
When we checked out the soccer website

going on computers
The muscular guy was cool
The website
learning which muscle was which
The website
When we went on the computer
going online for the anatomy of a kick
Surfing the website
Couldn't find anything to like about it
getting on the website
The website
C.O.W.S.
The website
the website
I went on computer
The website and the game.
It challenged what I already knew, yet it wasn't too extremely hard to figure out!
learning about the muscles
The computers
The internet site
The website
I liked trying to figure out which muscles you used to kick a soccer ball first, than second, etc.
I liked putting what muscles you use first in order.
getting to notice this experiment.
maybe seeing the website
When we got to use the laptops
The website.
nothing really
The skeleton
Going on the website.
Working on computer
going on computers
Figuring out how to make a Kick
all
The computer thing
I learned a lot and it was easy.
Going on to the website
When we went on the website.
The computers
going on the computers with my hommies
the website
Working on computers with partners
to see how muscles work
website
learning on how your bones & muscles function.
using computers
website
the bones
Getting on the website
doing the quiz on the website
How they showed the way the persons moved in the computer. It looked real.
How we went to get a walk and a computer
I liked when we were standing up and the teacher was showing us how the body parts move
We finally actually did something
Putting muscles on the dinosaurs.
The website
Going to the website
how the bone moves in us and in dinosaurs

I like the part when we were figuring out the muscles in our body.
The website
That we got to guess on the website
When you feel which muscle helps you kick
We got to learn how our legs work.
How our muscles can do different things.
Looking at the computer of the bone
When we got to go on the internet.
Watching the person kick the ball on the internet.
Going on the internet.
I liked that we went on the internet.
I liked the website. It made the lesson more interesting and easier to understand.
using the computers
Going on the internet
Watching the movie on the computer
Going on the internet
Going into the computer lab for the leg.
Talking about the different muscles in your arms & legs.
That you can learn about your muscles.
I liked figuring out which muscles worked during a kick.
Going to the website
Going to the website
Going on the internet site and seeing the guy kick the ball and guessing which muscles he used first.
I learned something different & interesting.
the website of the anatomy of a kick
I got to see the kick and what points and parts of the body were used.
The website
it was interesting to go on the website.
The soccer guy
The website
Learning more about soccer
I like everything that we did in this lesson
I liked going on the internet to learn about the minerals.
It had to do with research, so it was interesting.
Going on the computer and having and learning new things.
Everything was understandable.
The skeleton kicking the soccer ball.
Try to figure out how to make him kick.
I liked when we put the muscles on the dinosaur.
Going onto the website.
I liked going on the internet and playing that game.
That you have to figure out what muscle goes first for kicking and finding out how many muscles are in one leg.
Going on the website
Going on the internet
Is going on the website and learning the different types of movements of the muscles.
Going Online!!!
When we went to the website
How muscles attach to bones and contracted and allow someone to kick a ball.
I liked that we got to go on a website.
When we went on the website.
To see the movement players use every game a thousand times.
The website
I liked getting on the computer.

The website
You saw all the muscles you use to kick a ball
I liked trying to figure out the order of the muscles used.
going on the internet
The internet
It was about muscles and soccer

I liked the different groups of muscle and the way we explored & found out about what muscles we use to kick
I liked going on the internet
I liked most that we got to use the internet to help us understand.

What did you like least about Lesson 3?

I liked how they showed it on the computer and you could see the legs clearly.
I did not like that it was a little confusing.
My computer was not working and I had to work with a different group.
This lesson was interesting.
I did not like the part were we had to read on the first part on the website and it took too long to come up.
Nothing
Nothing, I enjoyed it.
When we could not type in the long website
I liked everything.
When we had to draw the muscle of the dinosaur
What I liked the least a typical someone could not listen to what I said, missed question 3x's.
Nothing
I liked everything about this lesson and I don't like nothing.
For me, the website was easy, but few of my classmate had some problems when we were trying to type the website.
The game.
Nothing
The lesson was kind of boring.
Having to wait for our teacher
We could not see very well on the projector because the door was messed up.
It got a little boring.
Trying to name the muscles.
We did not do much
Nothing
I did not like all the names of the muscles
everything else
Nothing
Nothing
I can't remember
The dinosaur drawings / examples
The website
The student materials
Loved it!
Nothing
I did not learn anything from it.
Nothing much
It was monotonous
I didn't really understand it. Maybe it might have went by too fast.
We did not do much
Having to make the opposite joints even though I got them right.
I did not like the website. I could not even see it well.
Sitting the whole time.
The lesson itself was horrible, but the cheap animation was worse.
It was fun
Having to guess about which muscles moved which bones.
Nothing
Nothing
None
Nothing
Nothing to say
It was sort of hard
Nothing
I liked it all
Nothing
Nothing
I liked the lesson
I liked it
Nothing
I thought it was sort of boring
The length
Nothing
Nothing
If you messed up how to kick it, just said wrong rather than messing up the kick.
Nothing
It was too easy
Too confusing, really hard
Typing in the letters
Nothing
What I didn't like was how they picture moved too fast. A little slower would have been easier.
Nothing
I didn't like it in general, it was boring.
Web
It was too easy
I did not liked the confusion
I thought some of the lessons at first were a little confusing.
How you had to pass a brainless but hard test to see the kick.
Loved it all!
See Comments
It was too short
It was a little boring compared to the others.
There wasn't too much writing to explain.
Nothing
Nothing
That when you got it wrong the leg did not show the motion you wanted it to.
The guy should have fallen or mess up when the muscles were in the wrong order
The website
It just put it right in front of you and you didn't even know

about the muscles so you had to guess.
Didn't quite get all relations to muscles.
I cannot decide which part I disliked, if any.
It was too short
They should have shown the muscles kick together.
It was hard
Should have shown more muscles.
When you got the wrong order, they guys should have messed up and fallen or something
I don't recall anything I didn't like
I didn't dislike anything in this lesson.
Hard to follow
It wasn't challenging at all
I wished there was another example
Boring
It was too short
The diagram
A little boring
It's all good
It was easy and I didn't really learn anything
Writing
It was a little confusing
Short and easy
Paper
Overheads
It wasn't very interactive.
Nothing
Nothing
You can't see were the muscles are on the skeleton very clearly.
I loved it all
The test part
Nothing
I liked them all
Hard to figure out which muscle was being moved.
Talk
Kind of boring but not too bad.
You should make the website longer instead of just like 10 minutes. Examples would be fun.
Talking in class
Dinosaur would be fun if on computer.
Having to look at the muscle contractions.
homework
homework
When I got the answer words on the computer
The computers broke
write stuff
getting the puzzle wrong
Trying to figure out the order in which he used his muscles.
it was all good
It was easy
It was long.
I think there could have been more on the website, because I loved what was on it already!
doing the graphs
Getting to the website
the part where we found out they made the bones move.
The worksheet
computer
working in groups of three
Was a little too easy
The other stuff in it was boring

I liked a lot, but I don't remember what I didn't like
the difficulty level-some things weren't hard enough
figuring out what muscles went first
I liked it all
that we couldn't try it ourselves
Don't remember
The worksheet
The cows (computers)
Don't remember
when we had to get the letter in order on the website
The worksheets
the test at the website
Don't know
The homework
I already knew how to kick a soccer ball.
the worksheet
not sure
website
just guessing the odor of how the muscles worked did not explain it well enough to know what they all do.
That you had to guess the sequence and I didn't understand it.
computers got a virus
the info
Having internet problems a little
I have no least favorite
The website was confusing!
Wasn't too interesting
I didn't like this lesson, it didn't really answer the things I wanted to know.
I liked least about it was hard to tell which number you had to look at.
I enjoyed everything!
Trying to put the muscles in order
guessing the order of the "kick"
it was boring
the internet website was boring
It was hard to get the right combo
There wasn't much (can't think of any)
This lesson was a little boring at times.
guessing the order of the muscles
worksheet
It didn't have any activities
When we went on the computer it didn't teach much
being on computer
looking at the websites
I don't know
It wasn't really interesting
The website was boring
the game on the computer
I didn't really understand some of the information
it wasn't very interesting
When it was over
the website
Putting the things in order
not getting to actually see someone kick a real ball
None of it
solving the puzzle
it was boring
The test on the website
Trying to figure out the muscle pairs
I liked it all

The worksheet that went with the website
I thought watching the skeleton and muscle man kick the ball wasn't helpful.
none
trying to explain it (how they work)
filling in the square at the website
nothing.
no fun activities
the muscle man
Trying to figure out what bone did what
it was boring
trying to figure out letter order.
I liked all the examples in this lesson
none
I didn't understand the muscles
none
Sitting there doing nothing
I can't think of anything.
Being crowded around the computer
Dinosaur worksheet
figuring things out
the dinosaur
Bone were too small and too hard
Using the computer, Learning things I knew already
the picture on the website was kind of boring
I liked everything.
I like everything that happened today
The dinosaur worksheet, I didn't understand it
The scientific words were my least favorite part that I hate
When we had to label the dinosaur
How sometimes your muscles could pop out of one of your bones.
The writing
I knew most of it.
Labeling the dinosaur.
Naming parts of your arm.

I did not like when we sat in class and named parts of the arm.
The dinosaur sheet.
The dinosaur sheet.
The dinosaur sheet.
Going on the website.
I think it was too easy.
The diagram of the dinosaur
There should have been more to the site.
How biceps flex
The internet was slow.
It was confusing.
Liked everything
The questions were easy.
The exercise on the website because it was too easy.
Try to find the website
I didn't like the website part, I thought it was too difficult.
Some of the figuring out the right bones on the website was kind of hard.
It made me think about how to kick.
It was confusing.
The lesson was fun, there is nothing I can object.
The lesson was kind of boring.
I like everything, there is nothing I don't like.
I liked everything.
When we had to figure out which connected to which.
The way the skit was answered, it didn't make the question easy.
The computer was slow
The slowness of the website
It could have been more interesting.
I had a little trouble getting to the website.
our computer wasn't working!
The 3 facts that you had to write

Lesson 4:
Helping the Body Build Strong Bones

Lesson 4: Teacher Results

Table 30. Lesson 4: *Helping the Body to Build Strong Bones* General Questions

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson contained an appropriate amount of content.	0	0	11.1	11.1	55.6	22.2	4.89	.93
2. The lesson promoted thinking, inquiry, and study skills.	0	0	0	22.2	33.3	44.4	5.22	.83
3. The lesson was engaging (that is, it got students more interested in the science content).	0	0	11.1	0	55.6	33.3	5.11	.93
4. The lesson took an inquiry-oriented approach.	0	0	11.1	0	66.6	22.2	5.0	.87

Comments:

Well put together: group studies; graphs, overhead.
The lesson was a little short.
Some students were a little confused about the role juice played in the experiment. It seems like a confusing variable that should be addressed directly.
Since this lesson wasn't as "hands on" as the other lessons I feel students weren't as interested.

Table 31. Effectiveness of Lesson 4: *Helping the Body to Build Strong Bones* Materials in achieving Learning Outcomes

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. Students should be able to recognize the importance of diet and weight-bearing activities to the strength and health of their bones.	0	0	0	11.1	33.3	55.6	5.44	.73
2. Students should be able to analyze data tables to make evidence based conclusions.	0	0	0	11.1	33.3	55.6	5.33	.71
3. Students should appreciate that more minerals, especially calcium, in bones makes them stronger.	0	0	0	0	44.4	55.6	5.56	.53
4. Students should understand that different types of weight-bearing activities produce different effects on the skeleton.	0	0	0	11.1	33.3	55.6	5.44	.73

Comments:

Students were surprised (and wanted more info) on how/why astronauts lose bone mass in space. This led to a lively discussion on extended trips/stays in outer space.
(arrow pointing to #4 above) Still a difficult concept to "see" on paper. They got confused with the astronaut. (they didn't need that).
I think a more "hands on" approach would be helpful.
Milk study was great. Students understood the concepts being taught.

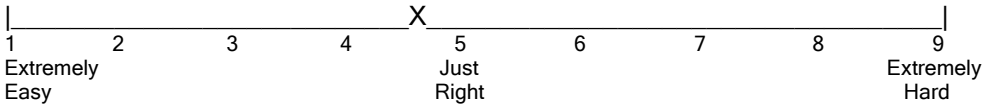
Table 32. Effectiveness of Activities in Lesson 4: *Helping the Body to Build Strong Bones*

	Very Ineffective 1	Ineffective 2	Mod. Ineffective 3	Mod. Effective 4	Effective 5	Very Effective 6	Mean	Std. Dev.
1. Overall, ***Lesson 4:*** **Helping the Body to Build Strong Bones** was	0	0	0	22.2	22.2	55.6	5.33	.87

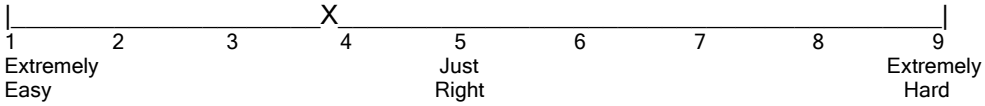
Comments:

Writing exercise of comparing b.m.c. of the 5 groups was done very well. Nearly all students were able to explain the change.
I feel that the students understood the lesson, however their level of interest wasn't as great as the other lessons.

Lesson 4: *Helping the Body to Build Strong Bones* Difficulty for the Student as Rated by Teachers. The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 4 difficulty mean = 4.67, std. dev. = .71.



Lesson 4: *Helping the Body to Build Strong Bones* Difficulty for the Teachers (i.e. preparation, delivery, etc.). The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 4 difficulty mean = 3.78, std. dev. = 1.64.



Comments:

None.
The topics of sports and astronauts generated much discussion in the classes - very engaging lesson.
Is there a more hands-on approach to teach this lesson?
The students seemed interested in this lesson. They worked well in groups (I had 3 in a group). They were all familiar with the sports involved in the study. Using actual research made it more relevant to us. Students could make a connection.
It is difficult following the script for me because I don't teach that way. I enjoyed using the study because it gets them thinking about experimentation. They actually came up with ideas for experiments they could do to follow up to what they learned.
The "Are All Exercises the Same" elicited a lot of discussion. The astronaut concept fit in well in how it was introduced. This was compared with swimming and that helped students relate. Homework assignment was appropriate for the lesson and worked well to tie everything together.

Table 33. Total Number of Class Periods spent on Lesson 4: *Helping the Body to Build Strong Bones*

	1	2	3	4	5	Mean	Std. Dev.
Class periods spent on Lesson 4	44.4	44.4	11.1	0	0	1.67	.71

Lesson 4: Student Results

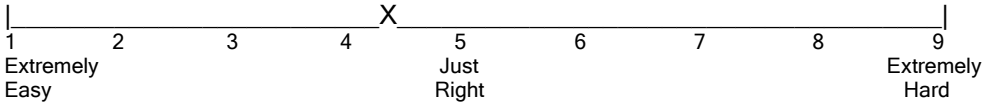
Table 34. General Questions on Lesson 4: *Helping the Body to Build Strong Bones*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson was interesting.	3.9	6.1	12.4	26.8	34.5	16.3	4.31	1.27
2. I could read the material easily	1.1	3.0	4.4	25.9	43.8	21.8	4.74	1.02
3. I could understand the examples and explanations.	0.8	2.5	7.8	22.2	44.2	22.5	4.74	1.03
4. The lesson made me think about new things and questions.	6.9	7.5	17.4	27.6	25.7	14.9	4.02	1.40
5. I could understand the scientific information easily.	2.2	2.2	10.2	23.7	28.0	23.7	4.64	1.14

Lesson 4: *Helping the Body to Build Strong Bones* Difficulty.

The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the students to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.

The lesson 4 difficulty mean = 4.33, std. dev. = 1.58.



Student Comments on Lesson 4:

Thanks for this information.
It was great!
This lesson was interesting.
All 5's
This was not very fun, but I did learn a lot.
Well it was obvious milk would be better.
I could understand most of it but some I could not
This was a harder study than the first one.
It was not fun
I thought the order of the sports was very different
I liked learning what was best for your bones.

A good lesson
Having the surveys made it easier to understand the lesson.
Kind of boring
I don't remember this lesson
My parents are on a "live it" and told me all about this.
The lesson was boring
It took me awhile to comprehend some of the homework
It was really easy for me to do this lesson.
no
It didn't make me want to ask more questions.

It really didn't teach me anything because I already knew this.
Good

Add a website page

What did you like most about Lesson 4?

The teacher explained how this lesson analyzed diet & weight-bearing exercise contribute to bone mineral content.
I liked it because it was fun and I also like the 2nd lesson about the pasta.
I liked it when we had to compare the different exercises. I found that some exercise are better for you and some were not.
It told me which exercises were just right.
That I learned something new.
Talking about bones
I liked that there are certain items that helped the bones.
It was a lot of fun
I liked mostly everything we did on the how diet and weight-bearing exercise contributes to bone mineral content.
I did not liked anything.
When we had to try and figure out which one makes you lose more weight.
I liked the lesson because I learned that sodas can slowly dissolve the bones and make it weaker.
When we had to find out how much milk will help your bones and how orange juice does.
What I liked most about this lesson was I learned how to keep my bones strong and I learned new things.
That we got to figure out what sport make our bones strong and what good for our health.
When we worked together to find the answer.
Getting to see the effect on bone diet had.
I liked how you taught us how to make our bones stronger.
I liked reading about the studies, that was interesting.
Hit close to home because of being a teen.
I liked guessing
Guessing the answers and seeing how orange juice and milk were different and talking about people in space.
I liked reading all of the tests people did on the subject.
I got to learn that drinking milk actually gives you more bone density.
The whole thing
Learning that orange juice is just as good as milk.
I liked the comparison of sports.
How it showed us how big of a difference it made between drinking milk and orange juice.
I liked finding out that milk does not make you stronger
How we learned about how your diet can contribute to bones.
I thought it was interesting to look at the results of a real experiment.
I liked the rat experiment
The pasta
Equal
I liked learning about how diet and exercise can affect you.
The examples
Learning about the stuff
The only thing we did
The guessing if milk made people stronger
Finding why milk is better for you.

I am not sure
It was easy to understand
I liked to see the result of the experiment
The human study
Learning about the calcium that needed to go into bone.
The guessing of what sport built the most bone density
I do not know
When we finished it.
Looking at the data and seeing what happens.
I liked finding the results of what happened to the teenagers.
The Food
I liked thinking about what would happen to the kids (exercise) body and bones when drinking milk and orange juice.
The scientific study was cool.
I liked seeing how orange juice and milk worked in the body.
Don't remember
I liked when we did the tests.
Learning that milk and orange juice don't make a difference in your strength, (which one you drink).
The study was somewhat fun and I learned more about creating strong bones.
The lesson was ok
Getting to examine the information
I liked looking at the study.
Don't really remember
Learning which drink is better: Milk or Orange Juice, it was interesting because I didn't know that orange juice doesn't have calcium.
I liked the rat survey
I wasn't here
It was fun and I thought more about it.
Got to draw graphs
Got to draw graphs
The math
I liked how it was about rats
Making graphs
To see how body is built
I mostly liked all of them in the lesson
The examples
Examples
Learning about what to eat and drink to keep your bones healthy
Learning about the proteins
It was interesting
I enjoyed learning what made the bones strong and how they get that way.
Examples (animals, rats)
Seeing that pure orange juice helped bones.
I enjoyed the survey
It was interesting
That I learned something new.
The concept of rats carrying weights and going up ladders!

I liked how I learned how to build up my muscles and I liked the lab that the teenagers conducted.
I liked how you could compare the examples of sports to what sports you did in your own life.
Discussing it with the class
Learning about the plane dive for film shoots
Learning about the difference
Looking at the surveys and having solid evidence which proved and backed up the things that we're taught in the lesson.
It was just right
I liked the examples because they were easy to relate to
To compare it to what I do and learning about myself. The inside.
The talking about it
Interesting
Everything
Learning
Mrs. Johnson made it really easy and explained it good.
Learned something new
The teacher used expression
It was fun
Splitting into groups
Stuff
It was hands on
The overhead demonstration
I don’t know? Everything!
Working with partners
It had to do with a study we could relate to.
Partners
The information
Examples
All the same
I liked the topic
Stuff
It was interesting
Was interesting
I got to learn how to eat right.
Finding the bone mineral content of each group
homework
The assignments. They made me think.
Working with partners
learning how to get stronger
I don't remember
circling the bones
the lesson and information
I liked learning how astronauts actually have the least bone mineral content and why. Very interesting.
It was just right
you learned how to keep bones healthy
We learned how to keep healthy bones
I learned a lot about exercise and what exercises I should be doing to have strong healthy bones and muscles.
The bath tub diagram
I wasn't here
Deciding which exercise was the best
I liked it all
The experiments
not a lot
learning about your muscles
Don't remember
Don't remember

The way the material was presented.
Seeing if our answers were right
No homework
seeing where the dinosaur bones move
Don't remember
Don't remember
the facts
It was interesting and fun to guess on.
talking strength
doing the worksheet
Learning about how exercise helps you was interesting.
the part were I fell asleep
When we had to write what the things were for with the bath tube and drain.
bath tub example
When we figured out how diet has effect on our bones.
The graphs
I don't know
learning how to keep my bones strong
Stuff
learning what exercise and eating right would do to help your bones
I learned which activities were the best for strength and fitness.
sleeping
exercises
being easy
the orange and milk groups
learning about weight bearing activities
We got to break bones
the example of the bath tub helps the lesson a lot
The project
Talking
I liked more about it was extremely fun cause we did a project to analyze about the data shown.
Don't remember
Circling the dinosaur's bones
That when you exercise, your muscle cells increases in size
Everything
Don't know
Partner work
the facts
it was fun
I liked the experiments
it was stupid
the facts
Learning about which exercises are best for me
partner work
breaking bones
with the spaghetti
dinosaur
trying to figure out which group was best for your muscles
I don't know
Nothing really
The graphs were quite easy to read
learning how to make strong bones
All of it
not very much
The thing with the groups drinking milk and stuff
When we talked about how diets affect the body
It was all fun

stretching
Everything
no favorite
the activity
Seeing who was right and how wrong we were.
when we analyze on how diets & weight is affected in exercise
It was pretty fun.
what you can do to build strong muscles
The sports helping with bone mineral
breaking bones
Comparing the exercising on the worksheet.
Was not here
finding out how it all works.
It was fun because I found out that there's lots of ways to build strong bones.
When she told us about the study about the people
was not here
The bathtub example
Making the bar graph
the demonstration
I didn't like anything
all
That I learned a lot no homework
Was not at school
Everything
Everything
Don't remember
The bath tub paper was easy to follow.
how to build strong bones
Poster
Making my poster
I liked all the things we did
the worksheet of exercises
It was fun
The worksheet
learning about astronauts & how it affects your bones & muscles
How they classified the thing
How we did a comparing with sports
I think when I found out what sport gives you more minerals
When we had to guess what came 1, 2, 3….
Giving rank to the different groups.
the experiments we did
the sports stuff and everything
I like the examples and the explanations.
We got to interact with others
That we got to guess what sports we're first.
what you could do with your spine and hip.
I got to learn about what sports I should play the most.
How there are minerals in bones.
That I know what's the best exercise.
When we had to conduct which had the biggest mineral content.
I liked how it compared sports groups.
I like the graph giving the right information.

The graph that came with it.
The facts were interesting.
working in groups
Discussing this with my class
learning what's good for your bones
Learning about bone mineral
Discussion we had about the chart.
Debating the order of the bone mineral content groups
How some juices are good for you.
I liked figuring out with our groups the answers.
learning about the bone marrow content in different sports
I liked the milk study.
Seeing how different milk and orange juice can be to your body.
We talked about new & different things.
strength of bone
It showed me what sports we could play to get strong bones.
It was easy
The orange juice and milk
liked it all
The bone minerals
I like everything that we did and going on the net.
I liked learning about how exercise can help.
It was interesting because of the study in bones.
Everything
It gave good information
Everything
I liked the examples.
I liked basically everything
Doing the chart.
doing the graph
It told me how to have stronger bones.
You used athletes
Learning about what orange juice and milk could do to the mineral content of your bones.
The different experiments.
How to analyze a diet and weight bearing exercise tribute.
It was fun and interesting.
Same things
It was an easy question to answer
I didn't really like anything
I liked talking about diets.
I don't know
We got to compare people of different diets.
I am not sure
talking about all of the sports
Everything
It was about sports and milk
I liked the way we had to put the sports in order and found out which one used more mineral bone content.
I liked about the athletes
What I liked most was how we learned how exercise, milk & diet could help build strong bones.

What did you like least about Lesson 4?

Nothing
I liked everything.
When it said that if you don't do exercise you will become weak.
Nothing
Nothing
The rest I did not like.
Nothing, because it all went well.
I could not really understand it and the math was not very understanding with the lesson.
Nothing
Nothing
It was boring, I did not understand it.
No comment
I did not like writing about what we read.
It was boring, I wanted to do something active.
Nothing
That soda ruins your bones.
Nothing
I don't really remember very well.
Equal
I would liked to have more examples.
Nothing
Nothing
A lot of reading not as much fun
Nothing
Nothing
It was sort of boring.
The milk and orange juice bone density project.
Needs to be more interesting
When we did whose strong and whose not thing.
Only having a paper to read from instead of maybe a movie.
It was monotonous
Nothing was bad about this.
I can't remember how I felt.
It was good enough I didn't noticed anything wrong with it.
Reading the sheets
I liked it all
None
The orange juice and milk project
Wasn't here
Nothing
Didn't do much
Too much papers
Nothing
When we had to read
Writing things down
It was okay
Nothing
The materials
Getting bored
Nothing
Resistance part
I liked it all
Hearing that swimming was not the best of the given exercises.
Nothing
Killing rats

That at some parts the lesson was boring.
Loved it all!
Too many words and not fun enough
Nothing
The graphs
Nothing really
Though it was not really dislike learning which sports do what to help us grow strong, especially when one of the less desirable sports was one I partake in a lot.
I did not like the sports they chose because I couldn't relate to them
It was slow going
Boring, we just sat and listened
It was boring
Writing
I liked everything.
Hard to understand
Hard to understand
Material was boring
Discussions
It went quick
The overhead
I don't know? Nothing!
It's confusing
The fact that it was on paper and we didn't get to conduct the milk and orange juice experiment.
Nothing
There wasn't enough hands on stuff
The examples
Nothing, I don't remember doing this.
homework
I don't think I disliked anything
it was complicated
worksheets
I don't remember
finding out what muscles went went it moved
Comparing some of the sports with bone mineral content because some of them were about the same.
Learning about bone mineral content
it was just right
It was boring
lots of worksheets
I loved the whole lesson. I have no dislikes about it.
bath tub
That I was wrong
I liked it all
The researching
most of it
I enjoyed it all
Too easy & boring
Don't remember
doing the long writing report that was strictly graded
The assignment
all
don't know?
Don't remember
Don't remember
there wasn't anything I didn't like
Could it be a quiz on the computer, like the soccer ball

muscle one?
the worksheet
Talking about how you lose strength.
a little boring
I could say, but I would need another piece of paper
writing
the worksheet
Don't know
homework
I don't know
the worksheet
not sure
stuff
learning the movements of muscles in the dinosaur
Some of the sports aren't fun
waking up
not having the challenge
the worksheet
we didn't do any hands on experiments
Wasn't that interesting
It was all ok.
Too easy
I liked least about it was the lessons and how to do it.
I enjoyed everything!
The talk about diets
project
not sure
Not hands on
the hard homework
need more activities
it was more stupid
I was sometimes lost in the lesson.
information
worksheets
The report was graded too strongly
Nothing, I liked it all
dinosaur
doing the worksheet with all five things on it and you had to write about it.
I don't know
Everything that has to do with graphs.
too many papers
Everything
I don't know
it was a little boring
Can't remember anything else
I liked it all
stretching
Nothing
it was boring
The assignment
It was just slightly boring
I liked it all
I thought it was all fine.
none
The bathtub thing.
That America is the least exercising country in the world.
was not participant
the confusion at first.

thinking
none
none
Sitting there doing nothing!
Don't remember
I don't know.
making a big poster due the next day.
I liked everything.
the work
Too long
Learning things I already knew
doing the writing thing
I liked everything.
I don't think I disliked anything
We didn't do much. (I mean physically) like for example, we listened and did worksheets.
the evaluation sheets
I did not like the questions.
It got confusing sometimes
That we had to figure out the numbers of what sports.
How you can loose mineral from your bones.
Some of the surveys in here didn't seem right.
The survey on sports said that basketball and volley ball were ahead of soccer.
I mostly just liked this lesson.
I liked this lesson.
The sports graph study.
the studies about mineral content
figuring what sport is better for you
The chart on milk and orange juice.
Talking about the astronaut
It was a little confusing.
Doing the experiment
Some of the questions were hard. Putting the sports in order w/out the graph was hard (a little).
That we didn't really do an activity with it.
minerals and collagen
It was a little confusing.
I didn't learn much
Diet, because I couldn't understand it.
No comments, (questions too easy)
The questions
That the lesson didn't make me think about new things.
I least liked making the graphs.
I really didn't dislike anything
I liked all of it.
Doing the graphs, because it was kind of hard.
The math, bar graphs
I liked everything, there is nothing I didn't like about it.
Same things
I didn't really dislike anything
The lesson was boring
It did not really teach anything new. They should have explained more about how diet helped.
I liked everything, but it didn't really make me think of new ideas.
Swimming got 3rd!!!
What I liked least was it was kind of hard to understand.

Lesson 5:
Use It or Lose It

Lesson 5: Teacher Results

Table 35. Lesson 5: *Use It or Lose It* General Questions

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson contained an appropriate amount of content.	0	0	0	11.1	66.7	22.2	5.11	.60
2. The lesson promoted thinking, inquiry, and study skills.	0	0	0	22.2	33.3	44.4	5.22	.83
3. The lesson was engaging (that is, it got students more interested in the science content).	0	0	0	0	66.7	33.3	5.33	.50
4. The lesson took an inquiry-oriented approach.	0	0	0	0	37.5	62.5	5.63	.52

Comments:

The only "problem" I had was one student having a pet rat and finding parts of the lesson somewhat unpleasant to think about.

Table 36. Effectiveness of Lesson 5: *Use It or Lose It* Materials in achieving Learning Outcomes

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. Students should be able to describe how resistance training influences muscle.	0	0	0	11.1	44.4	44.4	5.33	.71
2. Students should be able to recognize that animals such as rats are used as model systems in research.	0	0	0	0	44.4	55.6	5.56	.53
3. Students should be able to use mathematics to organize and present data.	0	0	0	0	66.7	33.3	5.33	.50

Comments:

We had a very good discussion concerning animal use for scientific research. It was not a subject they had considered previously and they had many questions and comments.
These seemed to be established in the last lesson (although this one does it better) (arrow pointing to number 1B). The added concept is "use it or lose it" - if muscles aren't used, they are reduced in size.
The concept of sacrificing rats for the sake of knowledge caught the students attention - many kids were against the notion of killing rats - so they definitely were engaged during this lesson.
During training I didn't feel that my students would be able to understand the math, but they gathered the concept and understood the data.
The math portion took more time to explain even though it was all laid out on the worksheet. Perhaps 7th&8th graders wouldn't have needed as much explanation.

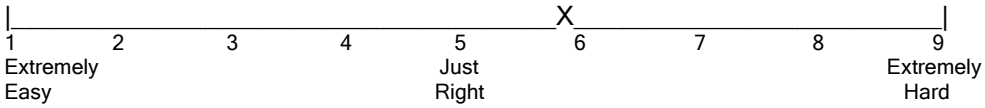
Table 37. Effectiveness of Activities in Lesson 5: *Use It or Lose It*

	Very Ineffective 1	Ineffective 2	Mod. Ineffective 3	Mod. Effective 4	Effective 5	Very Effective 6	Mean	Std. Dev.
1. Overall, ***Lesson 5:*** **Use It or Lose It** was	0	0	0	11.1	66.7	22.2	5.11	.60

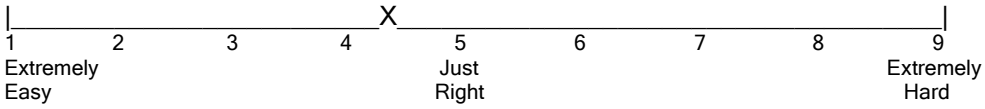
Comments:

Because of the small size of the FHL muscle (weight) the mass difference didn't appear to be huge - they had some difficulty understanding the loss of mass. (I think they were expecting a greater spread).
Changing the data to % was very useful, they saw the difference.

Lesson 5: *Use It or Lose It* Difficulty for the Student as Rated by Teachers. The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 5 difficulty mean = 5.89, std. dev. = .93.



Lesson 5: *Use It or Lose It* Difficulty for the Teachers (i.e. preparation, delivery, etc.). The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 5 difficulty mean = 4.33, std. dev. = 1.58.



Comments:

I really liked the graphing. It's something I don't do enough to show data. By the end of the lesson students understood "Use it or lose it" as evidneced by their writing.
Great lesson - hard to convince kids that the study was worthy of killing rats - they could identify with using animals to study infections, diseases, cancer, etc. but not for a study of muscle growth. Great graphing/math opportunities.
Students eager to discuss using animals in research. They had strong feelings pro&con. They could easily relate this lesson to real life - if they ever had a cast on their leg and once it was removed they did notice differences in size and strength, they could certainly connect with this idea.
The lesson was a bit difficult to present because o fthe script but the students were working together on most fo it and engaged. It was effective using the rat data and experiment because it gace them an idea of how scientists experiment. They also were able to see the limitations of experimentation i.e. there can be unforseen variables and some that are quite difficult to control.

Table 38. Total Number of Class Periods spent on Lesson 5: *Use It or Lose It*

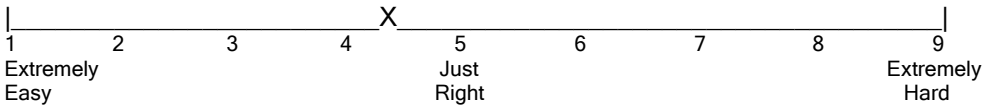
	1	2	3	4	5	Mean	Std. Dev.
Class periods spent on Lesson 5	42.9	42.9	14.3	0	0	1.71	.76

Lesson 5: Student Results

Table 39. General Questions on Lesson 5: *Use It or Lose It*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson was interesting.	3.6	7.1	8.9	23.2	34.9	22.2	4.45	1.32
2. I could read the material easily.	1.0	3.3	6.1	20.9	44.5	24.2	4.77	1.05
3. I could understand the examples and explanations.	1.0	3.6	9.2	19.3	44.0	22.9	4.70	1.09
4. The lesson made me think about new things and questions.	6.4	7.1	19.1	26.0	26.3	15.1	4.04	1.39
5. I could understand the scientific information easily.	2.3	3.8	8.9	23.7	34.9	26.5	4.64	1.20

Lesson 5: *Use It or Lose It* Difficulty.
The scale used for the difficulty of each lesson a line across the page with three easily identifiable equidistant points for the students to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 5 difficulty mean = 4.39, std. dev. = 1.60.



Student Comments for Lesson 5:

It was great!
I personally hated this lesson.
Good Lesson.
I learned the most in this unit.
I don't know if I just missed something but I didn't get it.
This study was kind of mean to do to rats.
No Thanks
No Thanks
I thought that the info was good, but it was boring.
Maybe a better visual
Better visuals!
Fun and interesting to look at what certain things did in our habits and exercise.
This truly was an interesting lesson and so "WOW"
What was the example? Hard to understand.
Weird
Get to the point
The rats made it interesting

this lesson was boring
This lesson was ok!
Hello! You watz up
I was absent at a funeral for this lesson.
It was great!
I have a pet rat
Most I disagreed because I was late to class. There was nothing wrong with it but since I missed half of class, I didn't understand anything.
Hate the rats
It didn't make me think of new questions.
Everything was great
OK
You should add a website page.
This one was kind of boring
It was a little hard to understand the scientific information

What did you like most about Lesson 5?

Nothing
I learned that if I don't use my muscles now when I get older I won't be able to use them at all.
I liked the whole thing because it was interesting
When it told me to use my muscles or I would lose it.
The fact that I learn
The way they used rats as a model system.
Learning on how the rat system works and how their training influences their muscle mass.
I did not like it that much
When we did the work sheet and when we talked about it.
I did not like it because I couldn't understand it.
Everything was okay.
I liked it when we had to create an experiment using pasta and rubber bands.
When we had to find out how much each sport is important to your body
It talked about rats doing exercise which it was something I'd never heard, but I liked it because I learned new things.
That they had test if we don't exercise our muscles get weak and sometime lose our shape. We learned something about our muscles.
I did not really liked it
It was really cool. It was a good experiment.
It was very interesting
I liked reading about the parts.
It was cool talking about the rats.
I liked learning about the study of rats.
We got to talk about rats.
That rats are similar to humans when it comes to muscles.
It was interesting
Nothing
I thought it was interesting to find out all the information and I liked Math, so the Math part was fun.
The rat experiment.
It was interesting
Most

That they used the rats for examples.
I liked learning about the rats.
The ease of learning
Learning about what happened to the rats.
All good
Learning about the rats getting the exercise was fun.
The argument about killing innocent rats
I do not know
I liked the rat study
I learned about how some rats with no exercise had different muscle mass.
Learning about the crickets.
Seeing what happened
I liked the rat part
Looking at the data.
I liked trying to guess what order the three groups were; for muscle mass and then finding out the answers.
I liked animals
I liked reading and thinking about exercise the rats and what would happen.
The rat study was pretty cool.
I did not like this because rats are dying and just because they aren't humans doesn't mean they should die.
I liked putting the sports things in order and then finding out the real answer.
I learned on how they did the tests.
Learning about the results.
The study was fun
It was ok
Interesting
It was interesting
I liked learning about if you didn't use your muscles you would lose them.
Rat mass thing. Learning how they weigh their mass
I liked all of it.
It was cool that they tried it with rats and stuff
Hearing what the rats do.

I liked learning all this stuff
I liked all the stuff
It taught me how to be health
Learning about muscles
I like people lost weight
All of it
The mice
Examples
Graphs
Examples
Learning what to eat and what not to do
I liked the uniqueness of this lesson and I like how the rat have the little belt and did some exercises
I enjoyed how they worked out the mice
The mice
The graphs were easy to understand
Learning about what is in us!
The rats on the ladder
The way the rats wore the weights
The thing when the teacher talked about the rats climbing the ladder.
I liked the fact how they had good ideas.
I liked finding out about rat muscles and how sometimes they have to work out!
How they used rats for exercising
Learning about bones
What make muscles strong and bones dense.
It was easy to understand
Thinking of rats lifting weights.
I enjoyed the graphs
Learning about what rats can do when trained
I liked the info.
Not sure!
Learning how they tested muscle and bones
Good Learning
I liked how we talked about it a lot.
I liked to see how to build up my muscles. I also liked to hear about the rats.
The hands-on part
I liked the experiment with the rat.
I liked the example of the rats.
How you learned about what they do to rats.
The rat climbing up the ladder
The training belts
The story about the rats
The rat resistance group projects was fun and easy to do.
Not very fun!
Knowing how the exercise and diet gets us stronger and you have to keep going.
Making the graph
I liked how the idea of this lesson went on to do/make something else. I liked making the graphs.
It got to the point quickly and portrayed the information in a fun and interesting way, as well as an easy to understand example using the mice.
Got me thinking of how long it would take for the rest period to go before the resistance was equal to control
The real life examples were interesting.
Learning what strengthens bones
I finally understood something in this unit
Learning what activities strengthen your bones, muscles and skin and also what is harmful

Story was funny
The charts showing the muscle mass of the rats
Learning about how bones can become a lot stronger in a pretty short amount of time.
Got the point, I learned something
The fact that not drinking milk wont make you weaker
I liked how this lesson was easy to understand and straight forward
They used interesting examples
Nothing
The graphs
Getting into groups and filling out the rat packet
Learning how to increase muscle mass and the rat thing
Graphs
Working with Booney
We could have partners to help
The partners
You could use partners
It was a new activity
Paper
Weird, lesson was on rats
The little mice.
It was not boring
Nothing
Partners
The work packet
Everything
I liked learning about our muscles and how they grow without exercising.
Working with partners
The fact that it was just right difficulty.
Partners
Very interesting
The bar graphs
Everything
Examples
The egg
I liked the work.
Not much
Nothing in particular
Talking in class
UV Stickers
I learned even if I gain muscle, I can lose it if I stop working out.
Killing a rat
reading
Rats
The whole thing, it was great and I liked learning about the muscles.
talking about it in class
That how not to loose your muscle strength
making the graphs about the rats
moving our arms
information from examples
Learning that if you don't exercise, you will lose your strong muscles.
stuff
taking about dissection
Learning about the tub and bones
See how to weigh a rats muscle
learned about lab rats
I understood muscles, bones and exercise much better.

Learning that training stays with you forever
our activity
When we learned about the rats
The worksheets and class talk.
rats
what you can do to build strong muscles
I didn't like it all!
The rat info
learning about the rats muscle mass
The experiment presented
The rats
That we learned a lot.
learning that you have to keep exercising or your muscles will shrink
don't remember
Learning about muscles
the facts were interesting
It was interesting to see how rat can be used and how the results turned out.
talking about the rats
weights
Learning about the control groups was interesting, but the fact that they used that rats I didn't like.
Studying the muscles
It's cool how they use rats for an influence for muscle mass
the rats worked out
everything
how they used sports and people to give the examples
When the rats were used as examples
Thinking about rats working out and lifting weights.
the animal parts
the rats
the activity
learning the story about the mice
I liked it all
The scientific information was very interesting and fun!
We learned some neat things
The different presentation
The project
the talking part and the dinosaur
Not at all
I liked most about it was we did a model system with rats and to tell how much mass they had.
The graphs, I like to read graphs
learning about the mice
The paper about the rats
how we found out about bones & muscles and how to use them.
how we had to calculate the problems
Hearing about how the experiment was conducted
the control group project
that you learned a lot
The fair
it was more stupid than the last
The fact about exercise and the outcome
learning about our muscles and how they grow.
activities
We got to go outside and get fresh air
The rat examples
I enjoyed everything
imaging the weight on the mice
Hearing about the rats and about how they put weights on

their tails
When we talked about the rat
learning about what arthritis does to your body
rats are cute
That you should keep exercising to maintain strong muscles
All of it
How we studied about muscles
What we can do to diet
it was informative
The project
The rat's thing
When we talked about the rat
We named the rats
Mrs. Maroon told Jeff J. to cover his ear while they talked about killing the rats because he had a rat.
Everything
don't remember
learned about muscles
The story about the rats
When they talked about the rats
Nothing in particular
The "use it or lose it" thing
The rats
When we got to work without partner
I didn't like anything the most.
I liked doing the additions
Making the poster.
it's interesting to see how everything works and the muscles
Where I found out that rats can use weights.
That they put weights on the rats and made them run up ladders
I don't know.
The use of rats
the rat exercise
Finding out how they find the mass of your muscle.
we had fun
I didn’t like anything in this lesson.
all
The mouse story about exercising.
I learned a lot and it was easy.
not at school
When we talked about the rats.
Learning about weights and lab rats
imaging weights on the rats
Working with real information that was taken over the rats.
it has rats involved for understanding muscles
activity with rat
learning about rats
I liked all
the learning about muscle tissue
Learning about the rats
learning about how they put weights on rat tails
That the way they explain and separate each group.
The bar graphs, which one is greater and which one is least.
Writing the chart
Working together doing the worksheets.
Filling in the graph.
The rat experiment.
that we get a good grade for this

The rat experiment.
I like the graphs.
If you do exercise and wait to see how strong you are, it won't be that much.
That we got to compare and draw a bar graph.
I liked the groups when they did exercise for 8 weeks.
We got to learn how much exercise we need so that we can be strong and have lots of minerals.
How you can get cool muscles.
That it was easy.
All the graphs & tables provided a good supply of information.
I liked the formula of how to find the percent of muscle gained.
Learning the different percents.
I just liked the lesson all together.
I liked the graphs. They helped me understand the lesson.
finding out the sports standings
Them training the rats to climb the ladder
The charts
The reading about resistance training
The experiment on the mice.
Graphing
learning about exercise
The graphs were fun to make.
Doing it in a group.
How we got to use graphs to do our work.
Rat groups
I enjoyed learning about model systems and how they work.
The helpful and easily understood diagrams.
Nothing, I don't like
The rats!
I like everything that we did and learn.

I liked learning about the training
It had to do with a lot of research.
Everything
How they did the whole experiment
The quote
I liked the example of the rats.
It was interesting.
doing it with a partner and doing graphs
How it taught about endurance training
You used rats
All the interesting facts that I learned about the training and rats.
I liked it all!
Like reading the rat data
How a resistance training influences muscle mass.
It was fun because I found out if you work out and then quit, you become weaker.
Using the rats
The fact that they used rats for their representing for this experiment.
Everything
Learning about muscles
it was interesting
I think doing the graphs were the most fun.
making the graphs about the rats
It was about muscle building
The different groups of rats and how we compared the groups.
I liked the explanations
I liked how we got to do the graphs and use the models of rats.

What did you like least about Lesson 5?

I did not get it
The fact that we had to talk about rats. I hate rats, but I liked everything else.
When it said that if you don't use your muscle, bones you will not be able to move well and your body will not function very well.
I liked everything because I learned something.
The math part.
I did not liked the math at all.
When we had to do math problem in a Science work sheet.
I did not liked the information, it was not very clear.
I did not like when the un-rubber wrapped pasta was rolling out of position
When we had to do the math problems.
It was a bit boring.
Everything was okay, but the math was kind of confusing too. If you can use another method about math.
It was not fun nor interesting.
Nothing
It was more common sense than learning.
They killed innocent mice
I was a little bored. I wanted to do some active stuff.
I did not like the study cause rats are cool.

That they killed the rats.
Everything, especially the disgusting part about the mad scientist taking out the poor cute defenseless rat muscles and killing them in the process.
I thought it was terrible that they killed rats. I have a pet rat.
I think killing rats was sad.
I did not like this lesson
Hand outs
I did not like that they killed the rats.
Hearing that the rats were killed.
All good
Nothing
I can't remember
I did not like how the rats were being killed
I did not like that animals were harmed in an experiment we used as learning material.
I did not liked that they killed the rats.
Nothing
Did not spend enough time on it.
I don't know
It was cool
Nothing
It was boring and hard to understand.

I did not like finding out they killed the rats.
Mean-sad, its was monotonous
The killing of the rats in the study.
That the rats were dying.
I did not like being asked questions up front and being called on without raising my hand.
How they killed the rats in the end.
Don't know
The problem was killing rats made me sick.
Reading the sheets
Getting to do the math, but I thought that making rats lift weight was mean!
Got boring
Cruelty to animals made me sad!
Finding out that they killed the rats in the study.
None
I loved it all.
You had to write too much
No hands should have showed a video
Reading
Losing muscles
It was fun
Nothing
The graph
Time it took
Too much math
Rats
Nothing
I liked everything
I didn't like the confusion about the 4 weeks and 8 weeks.
The graphs and how they tied weights to the mouse
Nothing
Using the animals as tests
I didn't
Nothing
Didn't get into too much depth
It took a long time to explain.
I didn't like having to calculate
It was boring
Killing the rats
People killed rats
Having rats being killed
The killing of the rats
That some of the examples were odd.
That it was boring
Loved it all!
Learning that they killed rats
Not enough info.
I didn't like how scientists kill the rats.
No fun lab, too short
It didn't involve much
It wasn't that interesting. I didn't like the rats dying, YOU SICK PEOPLE!!
How they kill the rats.
How they killed the rat.
They killed the rats
It was too easy
The mice weren't very interesting.
I didn't like this at all! It didn't help me at all and I didn't learn anything because it was just like Math! I felt like I was doing Math and not learning Science!

How this experiment was with rats instead of humans.
Some of the information were hard to comprehend
I did not like how there was no pictures or anything.
It would have been nice to actually see what the mice had to do and where they had to do it
It was only done on one animal. Try using the experiment on different kinds of animals.
Nothing! My only issue was I didn't know how to find the muscle mass at first. Don't worry though, I figured it out soon enough!
The sheet for % calculations was confusing
I thought that the graphs and calculations were boring!
My partner did nothing!
Graphs- this lesson was the most boring
Too easy
I don't recall anything that I didn't like
I didn't like the graph on the mouse sheet, it was kind of confusing.
The formula was confusing on the %'s
I didn't like that there was no visuals
I think a video on it would have taught us more
The fact that the rats were killed afterwards to find out the muscle density.
It was a little boring
It was hard and not interesting
Writing
It was very confusing
Couldn't understand the work sheet
It was kind of confusing (the work sheet)
It wasn't that interesting.
Not much group discussion talking about a rats FHL muscle
Graphs and chalk
It used too many numbers.
Everything was hard
Graphs and info were confusing
Nothing
Nothing
Confusing
I loved the whole lesson, nothing was wrong.
The graphs
The part were we didn't get to do the rat experiment.
Nothing
A little boring
Learning about the killing of animals. They do have soul's, how would you know if you can't see them?
Why couldn't they use another example like cats?
Homework
The idea of rats dying
worksheets
I thought it was mean to make the rats do that
after awhile I got tired of moving my legs
This lesson kind of repeated the same information. Use it or Lose it lesson.
stuff
I learned they kill the lab rats
It didn't have a great deal of hands on activities.
When Mrs. Moronn told us about how the people put weights on rats felt and make them climb ladders - it was sad!
How cruel they were to rats

don't have one
The worksheets we had for homework.
what they did to the rats
What you do the mice!
That they had to the poor rat? I think.
learning how they discover the rat muscle mass
I dislike the story / That is mean
the torture of the rats
don't remember
The worksheets
Reading it was just like reading a chap in a book.
learning that they kill the rats
no weights
I think it is mean about what happens to the rats, especially since my boyfriend has one.
I didn't like that they used rats for the control groups and tied weights to their tails, I thought that was mean.
what you did to the rats!
When we talked about rats.
The rats with weights
Don't know
I knew to drink milk already so I didn't think there was any point to it.
they killed the rats
how the rats pulled the weights with their tail
nothing
they killed the rats
Killing the rats
The vision of killing the rats
having to sit through it
What they do to the mice
Making the bar graphs
That rat were killed
the story were the rat had weights tied to him
The rat worksheet
the question card
What you do to your mice!!!
I liked least about it when we did a bar graph.
I enjoyed everything!
That the scientists take out the muscle to weigh it
Don't know
It was boring
Homework
They killed the mice with weights
you should have more activities
it was extremely more stupid than the last
How I thought swimming bring more exercise
At some points, I thought it was very easy!
not very fun
worksheets
Needed more hands on activities
that we didn't get to learn more.
This was cool
Making the graphs
I don't know
No activity
I wasn't very interested
it was sort of boring
when it was over
Really, nothing
The worksheet

The rats died
None
don't remember
Everything else
I liked the whole lesson
I liked rats and other rodents, so that part bothered me a little.
I liked it all
All of the worksheets
Those poor rats!!
nothing at all
rats
That they cut rats open to measure their muscles.
That we had to read and read, nothing really hands on.
nothing
the graphs
I liked everything.
worksheets
I have a pet rat
None
Killing the mouse to weigh the bones and I didn't understand the number thing.
it was boring
When she said that they have to kill the rats to measure their muscles.
sitting there doing nothing
I don't know
they killed the rats
I liked everything
The rats
Graphing the results, Learning things I already knew
Making the graphs
That they didn't explain much what the 4 week no train for group 2. The other is that group three also.
Everything was cool
I really didn't get it.
doing the evaluation sheets
I did not like the directions
I don't think I disliked anything.
We had to draw a graph to mark the numbers.
How you can't stop working out.
That the rats had to be killed to find out how much their muscle strength increased.
Doing the homework.
The rat study.
using mice for the study, then killing them for the results
That they killed the rats.
The charts got confusing with all the information.
The worksheets didn't go my way.
Discussing
learning about rats
Some of the questions and material was hard to understand.
Some things I didn't understand.
How we didn't get to have hands-on work.
They killed rats
I did not enjoy the fact that the lesson did not connect it with everyday life.
It wasn't interesting.
I hate the rats. P.S. Use something else next time.
I did not like reading about rats

I'm not really sure. The examples & explanations weren't too clear to me.
paperwork
I liked all of it
You killed the rats
How they made rats as a model system.
Using the rats
The fact they took the muscles out

They should have explained how you "lose it"
I liked everything
they killed the rats!!!
everything
I didn't like the rats.
It was just a little confusing

Lesson 6:
Shining the Light on Skin

Lesson 6: Teacher Results

PLEASE NOTE: 2 of 9 teachers did not respond to this lesson because they were not able to complete the lesson. They did however; give comments about the troubles they encountered.

Table 40. Lesson 6: *Shining the Light on Skin* General Questions

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson contained an appropriate amount of content.	0	0	0	0	85.7	14.3	5.14	.38
2. The lesson promoted thinking, inquiry, and study skills.	0	0	0	0	57.1	42.9	5.43	.53
3. The lesson was engaging (that is, it got students more interested in the science content).	0	0	0	14.3	42.9	42.9	5.29	.76
4. The lesson took an inquiry-oriented approach.	0	0	0	0	57.1	42.9	5.43	.53

Comments:

Timing wasn't good as we had 12" of snow 3 days before wanting to go outside for the lesson. I would like to do a comparison: fall vs. winter vs. spring.
Unfortunately, my suncheck timers didn't come in for this activity.
Students understood the concept, however I'm not sure if they would be willing to apply it to prevent future skin damage.
I cannot evaluate this because we did not have access to the website. Our system did not let us get in to use the website.

Table 41. Effectiveness of Lesson 6: *Shining the Light on Skin* Materials in achieving Learning Outcomes

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. Students should be able to use SunCheck Timers to estimate when they have received the maximum daily safe exposure to sunlight.	0	0	0	0	66.7	33.3	5.33	.52
2. Students should be able to formulate a testable question about exposure to sunlight and conduct an investigation.	0	0	16.7	0	66.7	16.7	4.83	.98
3. Students should be able to analyze and interpret data tables.	0	0	0	0	83.3	16.7	5.17	.41
4. Students should be able to assess the effectiveness of various types of sun protection.	0	0	0	0	50.0	50.0	5.50	.55

Comments:

The SunCheck timers were a hit. Students generated all kinds of way/ideas to check Sun exposure (lots of "what if" questions).
(Arrow pointing to #2 above) We had trouble getting results for their hypothesis on the web site.
I also had difficulty with Anatomy of a Kick. In fact, I had to use one computer in a separate building from the school to do it.

Table 42. Website for Lesson 6: *Shining the Light on Skin*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The students were able to navigate easily through the website without confusion.	0	16.7	0	66.7	0	16.7	4.0	1.26
2. The website aided in comprehension of the lesson.	0	33.3	0	50.0	0	16.7	3.67	1.51
3. The website made the lesson interesting for students.	0	33.3	0	50.0	0	16.7	3.67	1.51

Comments:

More frustrating, not enough data

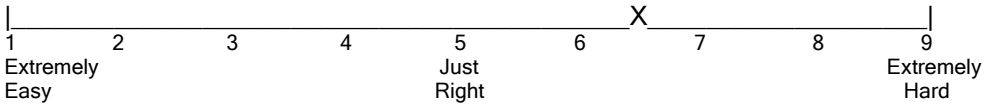
Table 43. Effectiveness of Activities in Lesson 6: *Shining the Light on Skin*

	Very Ineffective 1	Ineffective 2	Mod. Ineffective 3	Mod. Effective 4	Effective 5	Very Effective 6	Mean	Std. Dev.
1. Overall, ***Lesson 6* Shining the Light on Skin** was	0	16.7	0	50.0	0	33.3	4.33	1.51

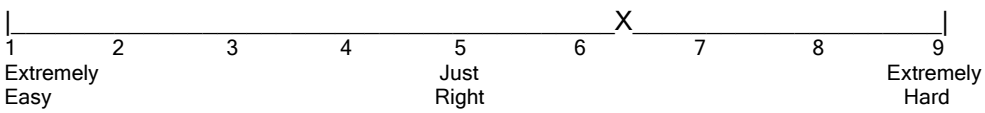
Comments:

We had problems with the website: Difficulty in phrasing an appropriate hypothesis. Difficulty using the variables to reach conclusions.
This is a great module, but it doesn't fit with the rest of the supplement. It seems to me that it can be used quite successfully all by itself.
I tried to add our data to the website - not sure if it was successful. When we tried to use the website for activity 1 the report results were often 0.00 minutes - or "0 out of 15 matched your selections"
More time needed for students to do their own experiment.

Lesson 6: *Shining the Light on Skin* Difficulty for the Student as Rated by Teachers. The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 6 difficulty mean = 6.50, std. dev. = .84.



Lesson 6: *Shining the Light on Skin* Difficulty for the Teachers (i.e. preparation, delivery, etc.). The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 6 difficulty mean = 6.29, std. dev. = 1.80.



Comments:

Couldn't get good consistent "responses" from the website. Different groups = same question = different answers. ("41.25" kept coming up all the time).
Suncheck timers need to be readily available.
The "activity 2" went much smoother, they enjoyed developing their own experiment.
Getting the suncheck monitor in time for the lesson (arrow pointing to difficulty for teacher). The kids loved doing their sun experiments - they were more interested in doing their own experiments before checking the website and generating a report - After their experiments we had great discussions on why or why not things worked as they did. We also got into why people have the diverse skin colors they do, adaptations for life in Africa vs. life in North Europe, and how all humanity originated in Africa, so at one time nearly everyone was dark skinned. This is a great lab before spring break - many kids wanted to take a suncheck monitor with them to their vacation spot (Hawaii, Mexico, S. California).
We were unable to log on to the website.
I didn't realize that the timers had to be purchased ahead of time. In my letter, it mentioned getting the bones but made no mention of the timers. As far as the websites I struck out had them on backorder at sunclothing.com. At suncheck.com I got "Data source name not found..." I then called twice using 402-214-5646 and left messages to call me at the school. I also emailed to globalsun@cox.net and no response. By now I am getting frustrated. At sunprotected.com only clothes were shown, then finally at herbaremedies.com I didn't see the order. I even called a local natural food and vitamin store and they never heard of it. I just visited this site again and did see the timers at the bottom of the screen. Although I did not purchase or use the timers, I would still like to get them and use them at a future date with the students. i had never heard of the product before I am interested in its use.
I am so disappointed. We had tested the Sun Check timers but were not able to use the website to analyze the data. I expressed to the principal and computer specialist in my school the frustration I am having with our computer technology.
Initially I had difficulty finding a company who had the SunCheck timers in stock. Students had trouble understanding the website initially. More explanation and perhaps more data in the data base would make it more successful.

Table 44. Total Number of Class Periods spent on Lesson 6: *Shining the Light on Skin*

	1	2	3	4	5	Mean	Std. Dev.
Class periods spent on Lesson 6	50.0	37.5	12.5	0	0	1.63	.74

Lesson 6: Student Results

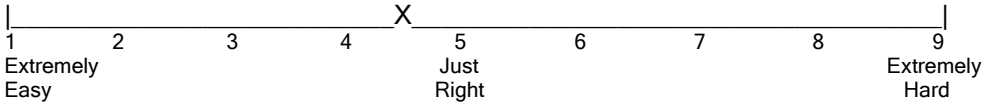
Table 45. General Questions on Lesson: 6: *Shining the Light on Skin*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson was interesting.	3.5	3.2	6.4	18.3	33.3	35.3	4.80	1.27
2. I could read the material easily.	1.0	2.6	3.8	17.6	42.3	32.7	4.96	1.02
3. I could understand the examples and explanations.	1.0	1.9	6.4	15.4	44.7	30.5	4.93	1.02
4. The lesson made me think about new things and questions.	5.1	2.9	14.5	24.1	30.2	23.2	4.41	1.34
5. I could understand the scientific information easily.	1.3	2.2	6.7	20.8	33.3	35.6	4.89	1.11

Table 46. Lesson: 6: *Shining the Light on Skin* Website

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. I was able to navigate easily in the website without confusion.	7.7	7.3	8.6	16.4	19.1	40.9	4.55	1.62
2. The website helped me understand how to conduct scientific investigations.	12.7	5.0	10.0	19.1	23.2	30.0	4.25	1.68
3. The website made the lesson more interesting.	12.7	7.3	9.5	14.1	15.5	40.9	4.18	1.36

Lesson 6: *Shining the Light on Skin* Difficulty.
The scale used for the difficulty of each lesson a line across the page with three easily identifiable equidistant points for the students to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 1 difficulty mean = 4.44 std. dev. = 1.50.



Student Comments on Lesson 6:

Website did not work
No one had done anything on the site and I did not go on it myself.
Did not go to this site. There was no information on the website.
Not available
Not available
Website was not functioning
It did not work!
Did not do, Absent
Not available
Did not see it
Website unavailable
We were not able to see the website
Not available
I did not navigate through the website
The internet did not work
Website did not work
Not available
Could not use
Website was not available
The website was messed
We did not do this, website was not available.
Unable to view website
Website did not work
Website had no information
Website was unavailable
The site wasn't available
The website didn't have any information for us.
Website didn't have info for us to use
website was not working
Website unavailable
Had problems with website.
Too hard to navigate the website
The website didn't answer my questions, there was not that much data.
The website did not have enough data
I couldn't get anywhere on the website. It didn't, except anything I said!
(didn't make sense)
Didn't get on website
I could not go on the internet
Computers were not working at that time, so we didn't get to do the website activity.

Computers down not working!
Computers were down
Computers were down
Didn't get to do website. The computer were down in our 5th hour class
We were not able to get on the website due to technical difficulties
Website did not work at all
Our computers were down
Computers broke
No internet, it was down
Computers were down
It was cool!
The website didn't have information and didn't really work.
Computers wouldn't work, don't know
Unable to use
Didn't do it
the answers were not complete enough and you could only ask certain questions
The computers were down when we did this lesson.
The website made this lesson interesting, but the website was also hard to understand!
Computers were down, unable to get on website
It was down
Unable to use computer!
The website didn't make sense
I was still absent at the funeral for part of this lesson. Sorry! It was in Colorado!
The website was confusing when you ask your question thing.
Computer down
This was the best lesson of them all, except the website.
It was cool!
Didn't do it
The computers were down so we didn't go on them
Don't remember
Didn't do it
The internet was down
Wasn't here
Computers were down - didn’t get to use them
and computers were down, couldn’t use them
it didn’t work
Hard
We did not get to use the website - the computers weren't

working.
Computers were down
I was absent
We did not do this.
Did not use website.
Did not do.
We didn't use website.
Didn't use
We didn't use it.
Did not do.
Did not use website.
Did not go on website.
Didn't use
Didn't use the website

We did not visit the website.
We didn't go to it.
We didn't go to the website.
We didn't use it.
We did not do
Did not receive the opportunity to view the educational website.
Did not do
It gave good explanations
Good
You should add an website
Using the internet helps to let me understand the lesson more.

What did you like most about Lesson 6?

How could you use SunCheck timers to study how the environment influences levels of exposure to sunlight.
I did not know that the sun can hurt people and can result in skin disease.
I liked the part when we learned about dark and light skin people.
When it said that the sun had vitamin D
The fact that I learned something.
When I learned about skin making vitamin D
Learning how much sun you need and how to prevent sunburn
What I liked about the lesson was that we talked about what sunlight do the skin.
I liked it when people who had super-sensitive skin had to stay in the shade.
What I liked most about this lesson was it taught me new things.
That we get to learn that people with darker skin can resist the sun because of the pigment called megmant (something like that) and the sun give us Vitamin D and that the temperature of the year affect the sun.
It was cool seeing how sunglasses filter U.V.
I liked making our own project.
I liked doing the experiments.
Hands On!
Working in groups
Having a good group and using soap was funny.
I liked doing the sun project with my friend.
It went quickly
Putting sunscreen on a sun checker.
The UV Light
Learning all about UV light.
How we use SunCheck timers to do a report.
The SunCheck monitors were fun to experiment with.
I liked the SunCheck
I liked doing the water experiment.
The parches and tests
The project with the SunCheck
I liked figuring out what changed things about the sun UV's.
Reporting on it
Doing the SunCheck
Doing the experiment of our choice with the SunCheck
Getting to do the experiments
All of it

We got to conduct our own experiments.
Doing the experiment
The SunCheck experiment
Finding a way to prevent UV
Doing the SunCheck experiment
Using the SunCheck was cool and seeing were UV light is.
Doing the partner SunCheck experiment
Experimenting with the patches and coming up with our own experiments, then looking at the data.
I liked seeing how the SunCheck worked and how I could prevent sunburn.
I could work in groups.
The experiments that we conducted were awesome.
Learning how things worked with our skin and how long people can stay in the sun longer or shorter.
The SunCheck and having tasks
I liked doing the experiments.
Making our own experiments
It was really fun and wasn't hard to understand.
Getting to do the SunCheck reports and writing it.
Going outside
It was fun
I liked using the SunCheck and seeing if putting different things over them would make them turn blue slower.
Checking altitude and latitude. Interesting.
Finding the altitude and the experiment
It was cool that we got to go outside and test them.
Got to do hands on activity
More stuff
That we got this cool little stickers that changed in the sun.
Nothing, not enough data
Going on the computer
Going on the internet
I liked it
Most of it
The experiment
The cool monkey stickers and going outside and learning new things about the sun and diseases you can get.
The stickers
Changing color stuff
We got to go outside
Going outside
Mrs. Johnson was great (again)
Going outside

Going outside
Going outside
Stickers
Going outside
The SunCheck
Stuff
Everything
Learning that when the sun is not out the UV rays still are coming down
The UV Stickers
Everything
We did hands on stuff
I learned stuff about not getting sunburn and get a disease.
The experiment
Going outside and watching the things change.
Experiment
The sun patch experiment
The website
Putting the sticker outside
The stickers
Everything
Going out and computer
Going outside to put out your paper.
Stickers
The UV stickers
Website
I liked the experiment
Going outside
It was fun
Computer
Stickers
Web page
UV Stickers
It was fun going outside.
Going outside and using certain things in the sun
Computer
Computer
going outside and using the SunCheck timers
going outside
I don't know, I wasn't here
putting the watches out in the sun
going outside
Website
Using the check timers.
The website
going outside and learning bout new things
it was interesting
learned about skin
I enjoyed measuring outdoors with the SunCheck timers, it was really fun and interesting.
When we went outside and used the SunCheck examples!
Learning how clothes affects your skin
using the cows
the sun timers
When we went outside
outside
going outside and using sun watches
being hands on w/ the sun things
Using the Sun timers
The timers
going outside
The way the lesson made me think.

testing the SunCheck
The website
the examples
That you learned a lot
The SunCheck Timers
going outside with the wrist bands.
going outside
getting to do something outside
Again, it was hands on
the SunCheck timer thing, where we put them outside
The cows
Using the SunCheck timers
Using the website was interesting.
When we got to do the sun screen and sunglasses and shirt experiment
The computers
Putting the timers outside.
When I figured out that darker clothing is better to keep from getting skin cancer.
The computers
we went outside
learning how to use the SunCheck timers and how stuff exposes to are skin
Stuff
when we used the SunCheck timers
The SunCheck timers and how they changed colors
The SunCheck timers were pretty
we played outside
The experiment we did
The website
going outside
going outside
The website
the project with the SunCheck timers
Sun timers
Website
Sun timers
I liked more about it when we went outside.
Using the net
I liked the SunCheck times
The website
how we found out about skin cancer
Not sure
going outside
The website
Putting the timers outside.
got to go on website
The experiment
it taught me not put sunscreen on
I knew a lot of the info already
Taking the SunCheck outside!!
SunCheck timers
All of the activities
when we went outside
Going outside and doing the testing.
When we went outside
Going outside
The hands on examples
Using the website
Where we went outside
The website
It was fun

going online using SunCheck timers
Surfing the website
The outside things
Using the skin check things
we went outside for an activity
The website
the sun watches
no homework
got to go outside
Getting to use the SunCheck timers.
when we put the SunCheck timers outside
The "sun" watches
was not here for all of this
The sun meter
going outside
When we went outside
Going outside and comparing protection.
I liked asking questions on the web.
doing the experiment.
Seeing how everything changes from different things
We got to go outside and check the sun check timers
We got to use laptops
How we got to go outside for the SunCheck timers.
Being on the computer
seeing the changes
The sun watches
Computer
Going on the website
all
The outdoor experiment using
We got to do some experiments
Taking the fake watches outside
When we took the SunCheck Timer's outside.
The computers
going outside
The timers
Working with the SunCheck, Skin dials, putting them outside for experiment.
to help me to not get sunburn
outside activity
All of it
The timers
we went outside
Going outside
doing the thing with the sun timers
It was easy to understand
A person with darker skin can stay in the sun longer.
The material was easy to understand.
learning about diseases cause by too much sun
Learning about skin

The reading part
The pro's and the con's
Talking about sunlight effect on different skin types
Going on the website
learning about UV rays
Learning about UV rays and the effect it has on skin.
I knew a lot of the things we were talking about.
I liked how we talked as a group.
About tanning
I liked it when we talked about the different effects of the sun.
I learned a lot.
Everything
everything, because it was fun.
The computers
When we went on the net because it's more interesting.
I liked learning about how the SunCheck can help you not get sunburn.
It had to do with more computer work.
everything
That everything was clear.
The patches
I liked learning about SunCheck timers.
I understood the examples
I liked doing the examples.
going on the internet and learning how much time for weather and different things.
How it said why I don't get sun burn.
Using the internet
The website was fun and the lesson itself.
More the examples than the website.
How SunCheck items check your skin to see if you have to go inside.
I found out the dark skinned people can stay in the sun longer.
learning about the SunCheck timers
The website was probably the thing I liked most because it made the lesson easier.
The web page.
Typing in things on the computer.
Nothing
We got to ask questions on the website.
I am not sure
going on the internet
nothing
It was about the sun
The way we had to guess on the website for the skin things.
I liked the facts about sunburn
I liked using the internet

What did you like least about Lesson 6?

I liked everything.
Nothing
I did not like it when it said that too much sunlight will ruin your skin.
Talking about the weather.
Nothing, I liked this lesson.
We did not have internet
I did not like it when the super-sensitive skin people had to stay in the sun for 15 min.
Nothing
It took a long time for it to turn blue.
Nothing
There was nothing on the website.
I did not like having to check it all the time.
Writing our report for Larry.
No one is going to pay attention to what their "supposed" to do in the sun.
Not much
Having to sit with my feet up in the air.
Typing up the paper.
The records
Having to write a report
Nothing that I can remember
None
The write up for the experiment
None
There was nothing on the website.
Did not see website
Nothing
Nothing
Writing the report for our experiment. I didn't really not like it through.
Nothing
I didn't
Nothing, it was all fun.
Writing up the things.
Writing the report.
Don’t know
It was fine.
Nothing
You need to cut hair
I don't know
The write up
The website didn't give us information.
Nothing except the part where we did the sun patches.
Problems with website.
The website was hard
The website didn't have a lot of data.
Not enough stuff
I didn't like that the SunCheck timer took a long time to changed.
None of the questions, used worked
The website
I liked the lesson
It was interesting
Nothing
No website
Boring
The wrong sticker

Boring
Writing
My paper BLEW away!
Boring
I lost my paper
Boring
Everything else
The work
No website
The coldness
Some papers blew away
Not having the website
It wasn't very interesting.
No website
Nothing
More experiments
The internet
I sort of did not like the website.
Boring
Talking in class
The only thing was at first, I didn't know how the SunCheck timers work.
homework
homework
I didn't dislike anything
wasn't here
waiting for them to be done
waiting on the SunCheck
hard time trying to find information
Going on the website. Didn't understand it.
it was all good
not being able to go online
It was long
I loved everything.
Computers were down, didn't get to use!
The work
don't have one
The website didn't work for me.
watch things
I enjoyed it all
Checking them
The reading
waiting for the results
We were unable to access the website.
the website didn't work, so we spent plenty of time on nothing
going outside, it was freezing!
the website
the website
don't remember
having to figure out how to read the sun timers
waiting for the timers to get done
The wait
The website on the cows
The website, but I thought the whole lesson was great!
The website didn't work like it was supposed to.
Everything
when we had to go outside
Being cold outside

Don't know
The homework
it was cold
nothing
stuff
the website
The website wouldn't answer any of my reasonable questions.
we had to come in
getting cold going outside
the website
The SunCheck timers experiment, it was stupid!
Website, it didn't make sense
Sun timers
I liked least about it was very weird.
I enjoyed everything
the experiment
test
Don't know
computer
the website isn't interesting
I liked it all
it was stupid
I knew a lot of the info already
the website was very confusing
The website didn't work
that ours didn't win
it was boring!
The website because I kept on getting 90 mins.
I don't know
Not going on the computers
The website wasn't unique
Going outside
When it was over
Nothing that I can think of
the website
going outside
the website
going outside, it was freezing!
I liked everything
It was way too easy!
I liked it all
There wasn't anything that I didn't like
The website wasn't that good.
nothing
nothing.
that our computer was messed up
Nothing.
The computer would not answer our questions.
putting the times on the items
I liked everything.
website did not work right
going outside

none
The computer didn’t answer any questions.
They were boring
none
When we went on the website
Sitting there doing nothing
that it wasn't exciting
I liked everything
figuring out if they were dark enough
it was boring!
Using the timers, Learning things I already knew.
the website
We didn't go on the website.
People with lighter skin get sun burn much easier.
I liked this lesson.
We didn't get to use the website.
not having the SunCheck timers
Not going to the website
Did not get the SunCheck Timers
The SunCheck Timers
Trying to understand
learning about sunburn
That we did not go to the website.
We didn't get to go on the website.
How we didn't get to use SunCheck Timers
sun light
This lesson was not as hands on as I would like.
It was confusing at first.
The computer
The website was confusing at first. I didn't know what to do.
Questions too easy.
I least liked the website, it was not very interesting.
I couldn't really understand the scientific information.
I liked all of it.
The website.
How you would get sunburn.
going on the internet
Having to guess on the website
The computers kept deleting what I wrote.
It was confusing
The lesson was a little boring and the website.
The explanations were somewhat confusing
I am not sure
we couldn't get on the website
It wasn't too fun
It would have been better if there was a better selection on the website or the choices. Too bad we didn't get to test the SunCheck timers.
I didn't like the internet info

Lesson: 7
Decisions Today for a Healthy Tomorrow

Lesson 7: Teacher Results

Table 47. Lesson 7: *Decisions Today for a Healthy Tomorrow* General Questions

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson contained an appropriate amount of content.	0	0	0	25.0	62.5	12.5	4.88	.64
2. The lesson promoted thinking, inquiry, and study skills.	0	0	0	12.5	75.0	12.5	5.0	.53
3. The lesson was engaging (that is, it got students more interested in the science content).	0	0	0	25.0	37.5	37.5	5.13	.83
4. The lesson took an inquiry-oriented approach.	0	0	0	25.0	37.5	37.5	5.13	.83

Comments:

I think the students should actually do a poster as a group or team or poster design. Students should be given the teacher background info and decide which part of the supplement they want to concentrate on. They then would create a poster to educate people at the health fair.
Students had a hard tome remembering what they learned from the previous lessons (done over 2 weeks while time off for parent conferences, service days and special schedules).
This was a good lesson, students were very artistic in demonstrating what they'd learned in the study.

Table 48. Effectiveness of Lesson 7: *Decisions Today for a Healthy Tomorrow* Materials in achieving Learning Outcomes

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. Students should be able to appreciate the roles of living cells in the muscle, skin, and bone systems.	0	0	0	0	87.5	12.5	5.13	.35
2. Students should be able to recognize relationships among the structure and function of the muscle, skin, and bone systems.	0	0	0	12.5	62.5	25.0	5.13	.64
3. Students should be able to explain how muscle and bone interact to produce movement.	0	0	0	25.0	50.0	25.0	5.63	.52
4. Students should be able to describe how lifestyle choices can influence the health of the muscle, skin, and bone systems.	0	0	0	0	37.5	62.5	5.63	.52

Comments:

Projects were very well done.

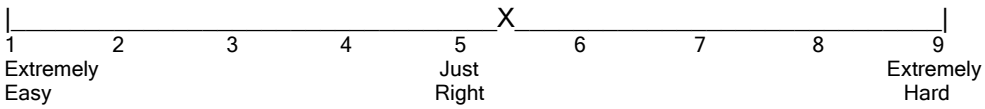
Table 49. Effectiveness of Activities in Lesson 7: *Decisions Today for a Healthy Tomorrow*

	Very Ineffective 1	Ineffective 2	Mod. Ineffective 3	Mod. Effective 4	Effective 5	Very Effective 6	Mean	Std. Dev.
1. Overall, ***Lesson 7:* Decisions Today for a Healthy Tomorrow** was	0	0	0	25.0	50.0	25.0	5.0	.76

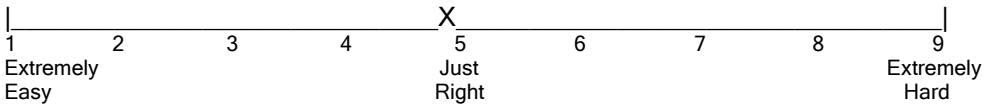
Comments:

Students got involved in their posters - many were very creative in expressing the key points of the unit.
Students were able to use their log books to refresh their memory - then compare answers after doing the outline solo - they enjoyed the chance to work in groups.

Lesson 7: *Decisions Today for a Healthy Tomorrow* Difficulty for the Student as Rated by Teachers. The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 7 difficulty mean = 5.25, std. dev. = .71.



Lesson 7: *Decisions Today for a Healthy Tomorrow* Difficulty for the Teachers (i.e. preparation, delivery, etc.). The scale used for the difficulty of each lesson was a line across the page with three easily identifiable equidistant points for the teachers to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 7 difficulty mean = 4.89, std. dev. = .64.



Comments:

Very well planned.
To completely finish lesson (poster) 3 days. Hint: I asked students to target an age group for their poster so my students who struggle w/a lot of reading and writing enjoyed producing a poster for younger kids.
This was the least interesting lesson - I don't know how I would have made it better - perhaps I should have given the kids class time to work on the brochure.
This lesson was good because it allowed students to demonstrate what they'd been experimenting on throughout the past weeks. It was a good way to end the field-test.
Students worked on projects in groups. They had great ideas for the posters. They knew what to do and felt comfortable sharing information. I gave them class time to work on projects. Most made posters, one group made a news show announcement.
The class seemed to enjoy discussing what they had learned from the unit and were eager to show what they had learned. They chose to make brochures and posters that described skin, bones or muscles and how to remain healthy throughout their lives.
This lesson was great for trying all the information together. Students worked in pairs and made posters, brochures or TV commercials. Students illustrated the concepts they learned during this module in their posters etc. Students presented their project to the class. They did a great job showing what they had learned.

Table 50. Total Number of Class Periods spent on Lesson 7: *Decisions Today for a Healthy Tomorrow*

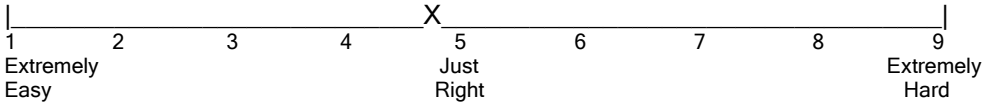
	1	2	3	4	5	Mean	Std. Dev.
Class periods spent on Lesson 7	37.5	37.5	25.0	0	0	1.88	.83

Lesson 7: Student Results

Table 51. General Questions on Lesson 7: *Decisions Today for a Healthy Tomorrow*

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The lesson was interesting.	5.1	6.7	9.6	24.7	34.3	19.7	4.35	1.35
2. I could read the material easily.	1.1	2.0	6.5	21.6	40.4	28.4	4.96	1.02
3. I could understand the examples and explanations.	0.8	2.0	5.6	20.6	46.0	24.9	4.93	1.02
4. The lesson made me think about new things and questions.	8.7	7.6	14.9	26.1	27.5	15.2	4.02	1.46
5. I could understand the scientific information easily.	2.5	2.2	7.0	21.9	37.4	28.9	4.76	1.16

Lesson 7: *Decisions Today for a Healthy Tomorrow* Difficulty.
The scale used for the difficulty of each lesson a line across the page with three easily identifiable equidistant points for the students to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard.
The lesson 7 difficulty mean = 4.76, std. dev. = 1.73.



Student Comments on Lesson 7:

This lesson was so boring! It was way too boring.
This was undoubtedly the most boring time of my life. Other than hearing some of the reports on animal thing.
This thing sucked @@@ hard!
This was boring, but it did recap what I learned
Too easy
It was boring
It was really short
The lesson was a little boring and you could leave out the fake mayor part.
It was fun
No thanks!
It was pretty easy to understand

The lesson ROCKED
This was pretty fun
This was the most interesting fun lesson of all! I think you should keep this lesson just how it is!
I really could understand after I saw all of the neat things
I loved it!
boring pointless
No, not really, but the fun part about this lesson was doing either a commercial brochure or a poster.
I didn't really make me think of new things because I knew most of it.
OK

What did you like the most about Lesson 7?

That you have to drink milk and exercise in order to stay healthy
It was easy and it made me really think
That we had to come up with different things to help other people know about their body and what will happen when you don't use your bones like songs, posters, poems and things like.
When we had to write something that needed to attract other kids to do for them to have healthy bones, muscles and skin.
Can't remember
About the health fair
Learning how the muscle skin and bone systems to protect parts of the body.
It was ok.
I liked it because we got to discuss with our group.
Nothing, because I could not share what I learned because we did not have a health fair.
When you had to decide what you want to do with your muscles, bones and skin.
What I liked about this lesson was we had a good time working as a group and reviewed all the information we talked about.
That we gathered the information of what we learned and review it and that we worked in groups.
I liked the fake letter from the mayor.
You could make it fun if people made a poster.
Working with Becky
The fake memo
I thought all of it was okay.
Really glad that there was not too much work.
Writing the poster.
Summarized everything we learned
Nothing
When my teacher was funny.
Nothing, it is boring.
It was a great refresher. I picked little bits of information I had not gathered.
Writing in all the boxes
Nothing
I did not take long.
The simplicity
Nothing
Nothing
Nothing
It reminded me of everything we had learned.
Was interesting
The fake memo
I thought about what we did
Reading the fake memo.
I do not know
When it finished
It was fun to put down all the possibilities. There were so many.
Not much
Nothing
I liked filling out the boxes
It was kind boring
I liked filling out the boxes with skin, bone and muscles.
Not much

Working in groups (partners)
No comment
It was ok.
Looking at the finished grid
It was fun
I don't know
I thought that the grid was a good way to review everything we had learned in this unit. It was helpful to review everything.
Working with a partner
I liked to review what each body part is used for.
Answering questions
Writing the functions of muscle, skin and bone
It was cool, cause we know what muscle bones and skin do!
We got to draw a poster on what we learned
We made posters
Everything
Drawing poster
Drawing
Writing
It's fun
Some of it
Examples
Learning about bones and muscles
How you take care of your body
I like the different things about muscle, skin and bones
I liked the idea of a poster to teach the kids
Nothing
Learning about human life!
Sunscreen
The info that was given for short of lesson
I liked the questions, they were pretty easy.
I liked writing about how our behavior affects our skin, muscles and bones.
I learned safety precautions
It was fun
It was fun to do
The graphs
The muscle section
Doing the chart in the boxes
Talking about it
Transparency was fun
Everything
Learning
The examples
Working with partners
Had papers
Going in groups.
Talking
The activity
Everything
Learning about the bones, muscles and skin.
The activity (chart)
Everything
Filled in papers
I liked learning about how they both moved, worked and what it does.
Getting with partners

The table was quite fun
Partners
The information
Everything
Talking
I learned more about muscles
I liked the paper work.
It was interesting
Website
Making the posters of the information given.
Making the poster.
talking with class mates
making the projects
creativity
project
Learning different ways to stay health
gone for project
using my creative abilities
Presenting what I learned
learned about muscle skin and bones.
I loved doing a project over the information because it was fun and easy!
When we made the posters
seeing everybody's projects
the project
Our posters
drawing
making posters
Doing the project
the project
Making the presentation
the project
The different presentations given.
creating health fair projects based on info we learned
the project
No homework
Seeing other people's posters
don't remember
Doing the project
presenting the brochure I made
It was fun to make posters.
sharing our projects
finishing the project
Doing the project
I really liked making my brochure and seeing other people's presentations.
Why do you keep asking me this?
we got to make posters for the science fair
It being easy
The project we did
Don't know
The project
the project
stuff
Doing the project
Seeing everyone's pretty posters
I learned a skateboarding move
Doing the project
Posters
making a project
Doing the project
I loved making the project and presenting it to our

classmates! It was more than fun!
It was fun
the different projects we did.
The project
the poster thing
the browser
We did a poster to help the government so everyone can stay healthy.
Using poster's
I enjoyed listening to other people's posters and working on them.
the poster
how the project so easy to get on it
When we had to write out what we thought of it
project
the project
Making the posters of the information given.
it was fun
I don't remember
It was an easy A+
the activity
making the posters or whatever for the "science fair"
project
making posters
that we made posters
coloring
Thinking of my idea for my poster.
When I made my poster
Doing a project
I like making posters
The posters
We made posters
All the info on muscles, skin and bones
liked making the posters
the project
The presentations
The project
We made posters
learning what to do to keep healthy
The posters
We made posters
Working on the project
when we did the activity
Making poster / brochure
the skin and bone system
The posters
The posters
When we got to make our posters.
Our projects
I liked doing the project.
Posters
Doing the project
I learned more about the body.
We could do what we wanted for the project.
I like how we got involved a lot by making things to promote exercise and eating right.
The ability to make a brochure or poster
Making the poster
I liked the poster.
having fun
Health fair.
Doing the activity

all
I don’t know
That I learned a lot and no homework
Making the posters
When we got to make the health fair things.
Posters
making the posters
making a project
to learn how to keep healthy
Posters
All of it
I hate it
Designing the poster
making posters for Health Fair thing
What we had to do with the experiment make a poster, TV/radio commercial.
Drawing the poster
The homework.
drawing advertisement.
The drawing of the brochure or Poster
that we got to make a brochure or poster
Everything
I like the chart
That we got to draw.
How you can grow muscles.
Making a poster.
I understood it well.
Filling out the chart.
The graph we made and doing the poster.
The chart
The chart with all the information.
making the posters
Making the poster
Gathering together as a group
Doing the chart
The making of the posters.
Doing the poster
We got to make a poster.
Learning together
talking about skin, bone and muscle
Making the poster
We get to make posters.

How we got to use our creativity.
What is muscle made of
We got to be creative with making a poster.
It was fun.
I liked everything
I liked everything because it was fun
Learning about calcium.
I like what we did.
I liked learning and making the poster.
It had at least five questions in it.
Everything
That everything or mostly everything was understandable.
That health is connected with exercise and the movement of bones and muscle.
All of it
I most liked making the things for the community health fair.
how we learned about muscles and the skin and the bone. There is a lot of things that I did not know about some of these.
Learning how bones, muscles and skin are affected by our behaviors.
Acting out and making up the skit.
What I like best is when we made the informational brochures and posters.
Making up my commercial.
All of it
That if you don't have any bones or muscles, your body will be all floppy.
That muscles, skin, and bones are important.
Everything
Getting to be able to perform our skit.
I liked making our brochure
The project
We got to make presentations
It was easy to understand
Making a poster.
I learned that you have to exercise
Making the poster and brochure, it was a lot of fun!
I liked making the poster and the brochure
That we learned how the muscles, skin & bones help you with everything & we got to do fun activities.

What did you like least about Lesson 7?

Nothing
This lesson was ok.
I liked everything.
The fact that I had to remember things for all the rest of assessment
Nothing
That your bones can't protect your intestines.
I liked everything.
Nothing
It was not very fun.
It was boring.
The questions were complicated
Filling in the poster
Was a little boring. I wanted to do some active stuff.
Writing super fast
Finishing it.

I absolutely hated every molecule about this lesson
All the little details I had to make sure I wrote down.
The chart
Everything
Writing all of it
Some of it did not make sense.
Everything
The whole thing
The whole thing screw the whole thing!!!
Too much writing
I did not like it too much
The poster
Making the list
Needs to be more exciting
How short and uninteresting it is.
There wasn't much room to write.

I did not like having to write things down from the overhead so quickly.
Monotonous
It was not very fun.
You used a fake mayor
Nothing, It was pretty fun
Having to write
Don't know
It had such a small amount of information and fairly useless
It was ok.
Writing the grid
It was boring.
It wasn't very fun
I liked it!
Nothing
Nothing
I liked it all
Reading
Writing
I liked the lesson
It is interesting
Nothing
The charts / Memos
Work
The bone system info
Nothing
Sort of confusing
I didn't like anything that we were reviewing, I already know
The charts/memo
The memo
I didn't
Nothing
That it was so short
It was sort of pointless
Nothing
I didn't like anything. It was a good review for me!
It was really boring
We could have done more experiments.
I liked everything.
Nothing
The skin section
Work sheet
Nothing
Nothing
Writing
I was confused by a lot of things
Not very interesting
Don't know if your answers were correct
It was kind of boring but most of what we did we already knew.
The charts
The work
Filling in the chart
The letter
I liked it all, I don't think that anything was that bad.
It was all good.
Nothing
Needs more
Taking notes of the board, when I hardly used them at all.
health fair
health fair
Deciding what to do

I can't think of anything
knowing what to write
Presenting information.
gone for project
standing in front of the class
lots of work
I loved everything!
When we had share the posters in front of the 20 some people - students - LOL!
Making a project
When we presented
writing
Presenting them
It was boring.
Presenting
Can't think of anything
nothing - it was great!
giving the project
Making the posters
don't remember
presenting the projects
making the brochure
Groups?
starting the project
there was lessons?
when we had to present our poster for the science fair
It took too long
Don't know
The homework
That I had one day to do a poster worth 100 points
the project was graded
I hated having to present at the health fair
stuff
about the posters
Making the posters was a little worrying (about my grade)
The homework
not enough days
presenting the projects
I liked it all!
We only had 2 days!
I liked it all
the read
I liked least about it was presenting.
Nothing, it was all fun
giving my presentation
making the poster
project
Don't know
presenting
need a movie
The health fair
It was confusing at first on how to do the poster or project
you could make it more interesting
presenting
Presenting posters
The project was difficult
it seemed pointless (not to be mean)
giving my presentation
I don't know
Not having enough time to finish the project.
The information was boring
The presentation

the worksheet
the amount of time we had to do the project
The presentations
We had to present it
the consequences for poor choices
the project
Going in front of the class and presenting.
I liked the whole lesson
I liked it all
When we presented them.
Boring projects
nothing
I liked the lesson
nothing
I only got a 90% on my project
none.
too short.
The presentation
worksheets.
nothing
none.
The poster
none.
none.
Working so long on the projects.
Sitting there doing nothing
I was confused
I liked everything.
I hate it
Presenting it, Learning things I already knew
taking all the notes
I liked everything.
I liked everything about it.
Kind of confusing
I dislike the scientific words.
How when you don't drink milk it's bad.
Making a song.

Making the poster.
Liked this lesson.
The text was kind of a review.
having to make them in so little time
Doing the chart
Filling in the chart
The chart making
Making the chart
I had already know most of it
doing the project
Making list of the questions & answers.
I liked everything.
The poster
This lesson was very fun. No complaints.
We had already learned the material.
Understanding the joints.
Some information I already knew.
It was too short.
I liked everything
The reason lighter people get sunburn faster than dark people.
I didn't like the commercial that much
I liked it all
Having to put info into the commercial!
When you would jump if you didn't have any tissue in your bones, it will break.
It was a little hard to learn it.
Writing the script.
The brochure
It wasn't really interesting
Presenting it!!
everything was great
Having to write all the information given on poster. It would have been better if it was a little bit more creativeness from the person doing the experiment.
That it was sort of confusing.

Lesson Comparison

Comparison of Lessons:

Table 52. Comparison of Lesson Levels of Difficulty for the Students as Rated by Teachers

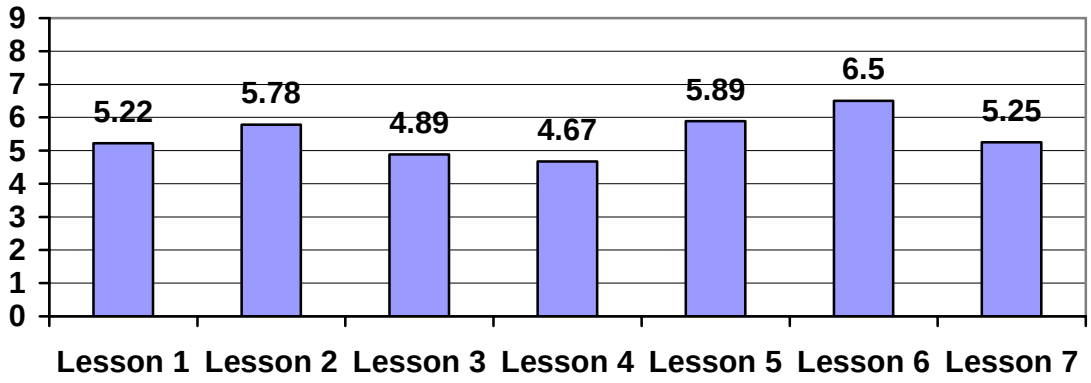


Table 53. Perceived Difficulty: Students vs. Teachers.

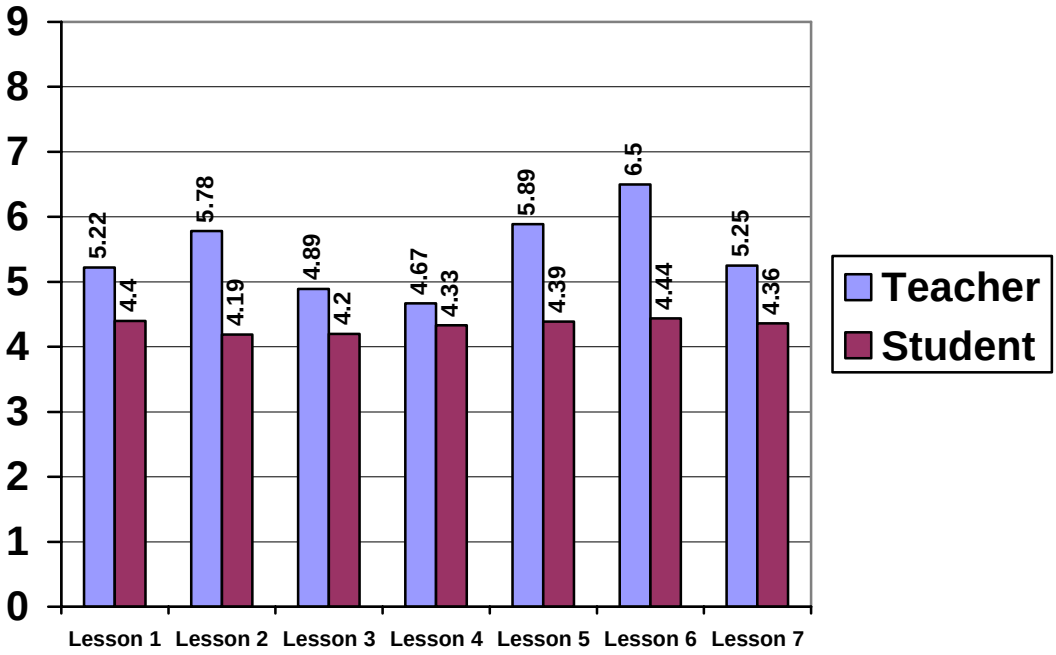


Table 54. Comparison of Lesson Levels: Difficulty for Teachers

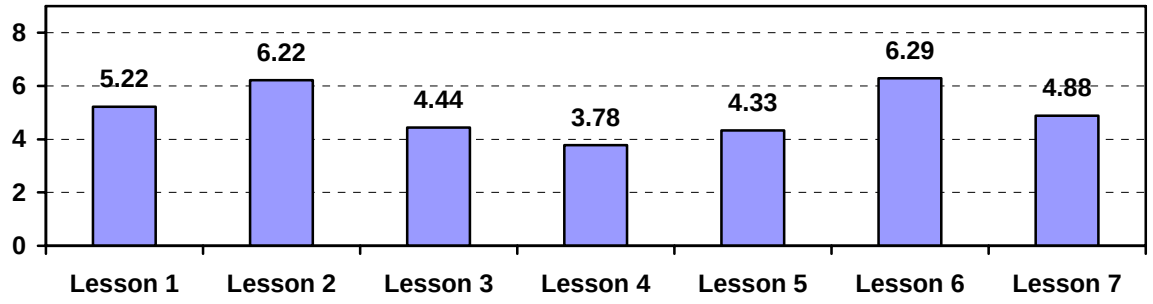


Table 55 depicts the number of class periods required to cover the materials. Discussions of the utility of replacement or supplementary modules, the notion of difficulty of the modules and individual lessons comes up frequently. Table 56 is a comparison of the levels of difficulty for each lesson as well as the overall module. The scale used for all these estimations by the students and teachers was line across the page with three easily identifiable equidistant points to mark a judgment. At the left extreme was 1 = Extremely Easy, in the middle 5 = Just Right, and at the right extreme 9 = Extremely Hard. The averages are all in the middle range, close to "Just Right", therefore we must conclude that for this module the developers hit their target. The estimated difficulty was slightly lower in student estimations compared to teacher estimates in all cases.

Table 55. Class Periods Spent On Each Lesson

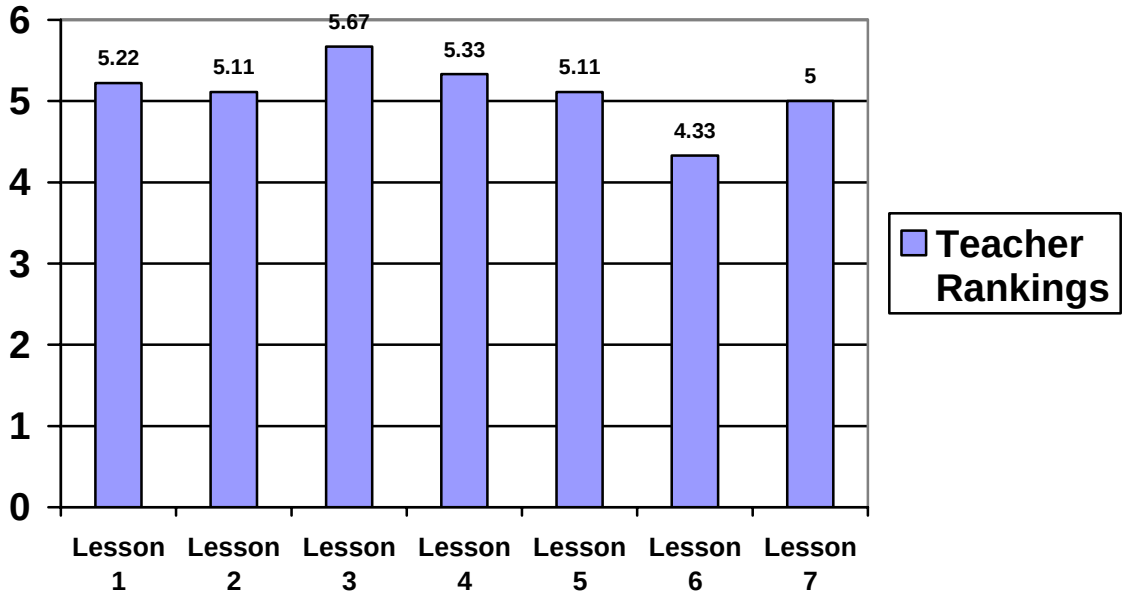
	Average Number of Class Periods Spent on Lesson	Rank with other lessons (1=highest, 5=lowest)
Lesson 1: It's' Alive! Or Is It?	1.44	7
Lesson 2: What Makes Bones Strong?	2.0	1
Lesson 3: Anatomy of a Kick	1.56	6
Lesson 4: Helping the Body to Build Strong Bones	1.67	4
Lesson 5:Use It or Lose It	1.71	3
Lesson 6: Shining the Light on Skin	1.63	5
Lesson 7: Decisions Today for a Healthy Tomorrow	1.88	2
Total of Averages for all 7 lessons	11.89	

Table 56. Comparison of Means of Teachers and Students on Level of Difficulty (Scale = 1 - 9)

	Teacher Difficulty (Prep, Teaching, etc.)	Teachers' Perception of Difficulty for Students	Students Self Reporting of Lesson Difficulty
Lesson 1: It's'Alive! Or Is It?	5.22	5.22	4.41
Lesson 2: What Makes Bones Strong?	6.22	5.78	4.19
Lesson 3: Anatomy of a Kick	4.44	4.89	4.20
Lesson 4: Helping the Body to Build Strong Bones	3.78	4.67	4.33
Lesson 5:Use It or Lose It	4.33	5.89	4.39
Lesson 6: Shining the Light on Skin	6.29	6.50	4.44
Lesson 7: Decisions Today for a Healthy Tomorrow	4.87	4.88	4.36
Average Difficulty	5.02	5.26	4.33

Table 57. Rankings of Lessons.

Teachers Perceived Effectiveness of each activity. (Scale 1-6). Teachers were asked to report the overall effectiveness of each of the lessons. Table 57 is a graphical representation of how each lesson was ranked by the teachers compared to the other lessons. **Lesson 6 was rated the lowest in effectiveness while lesson 3 ranked the highest**



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Overall Results

Overall Teacher Results
General Questions about the Module:

Table 58. Content:

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The content was a valuable addition to my curriculum..	0	0	0	0	55.6	44.4	5.44	.53
2. The examples and explanations were appropriate for my students.	0	0	0	0	66.7	33.3	5.33	.50
3. The amount of prerequisite knowledge required to understand the lesson was acceptable.	0	0	0	11.1	44.4	44.4	5.33	.71
4. Students could understand the scientific content clearly.	0	0	0	0	66.7	33.3	5.33	.50
5. The supplement could replace some lessons in my current curriculum.	0	0	0	0	55.6	44.4	5.44	.53
6. The content was related to real-life examples and/or students' lives.	0	0	0	22.2	33.3	44.4	5.22	.83

Comments:

Overall, my students really enjoyed the module.
I would want to expand some of the these concepts - like the skin unit.
(Arrow pointing to #6 above) Still hard for students but, it did help clear up concepts.
I will use this in the future!
It was appropriately challenging but interesting.

Table 59. Graphics: (Photos, Clip art, Illustrations, Tables, Maps, Graphs, etc.) In the Masters

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The graphics were clear and meaningful.	0	0	0	11.1	33.3	55.6	5.44	.73
2. The graphics helped students understand the material.	0	0	0	0	44.4	55.6	5.56	.53
3. The graphics promoted student thinking, discussion, problem solving, and inquiry.	0	0	0	22.2	44.4	33.3	5.11	.78
4. The graphics were engaging (that is, they got students doing interesting things).	0	0	0	12.5	37.5	50.0	5.38	.74

Comments:

Computer/Technology was well done and a valuable addition to the module.
Good Job!
The anatomy of a kick website was great! The clip art was good also.
It helped them to understand science as scientists do it.

Table 60. Website:

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The students were able to navigate easily in the website without confusion.	0	0	0	0	55.6	44.4	5.44	.53
2. The website made the major concepts more understandable.	0	0	0	0	66.7	33.3	5.33	.50
3. The website made the lessons more interesting.	0	0	0	0	50.0	50.0	5.50	.53

Comments:

See previous comments regarding the website for lesson 6.
These could be expanded to include more of the lesson.
With more data lesson 6's website will be more useful.
Anatomy of a Kick! Awesome
I have already expressed my frustration with technology in my building. Unfortunately this problem does not seem to get better the longer I am here.

Table 61. Teacher Background Materials:

	Strongly Disagree 1	Disagree 2	Disagree a Little 3	Agree a Little 4	Agree 5	Strongly Agree 6	Mean	Standard Deviation
1. The teacher's background materials helped me understand and support the lessons.	0	0	0	11.1	22.2	66.7	5.56	.73
2. The implementation materials helped me teach the activities.	0	0	0	0	44.4	55.6	5.56	.53
3. The relationship between *NSES's* content standards and lesson-specific concepts were clearly presented in the teacher background materials.	0	0	0	0	37.5	62.5	5.63	.52

Comments:

Teacher background was a little "wordy"
I was so pleased with the information given to me. It helped me "do my homework" before presenting the lessons to they went smoother.
It was used as a stand-alone lesson. The module was taught to 6th graders for field testing. In the future it would work well for 6, 7,& 8th graders.

Overall, Teacher Open-Ended Questions:

Describe how you used the materials

I made every effort to follow the lessons as written in the module.
I used the materials as specified in the curriculum.
I read the info prior to instructing and followed it as it was written, no "add libs" (which was hard)!
I put materials in a 3ring binder. It made it easier to work with each day. I made transparencies of those sheets that were requested. I did assign the homework that was suggested. I used the overhead to display transparency and to organize notes. Students took notes each day. Before we began each day we re-capped what we found out the day before. There was a good transition from day to day.

Any other relevant information about how you used the materials:

No - directions were clear and easy to understand.
We just completed a unit on hygiene, so this was an excellent continuation of that unit.
I used them to introduce body systems. I will continue with bones and skin a bit more. I used the materials as a stand alone unit. The students received credit for doing the unit, but I did not specifically grade the assignments.
The only change to material I made was, I made copies of all transparencies for each student.
I discovered by accident that drying water-soaked pasta creates a useful model of brittle bones - The pasta strands glue together, appear stronger, but are very brittle when stressed - like weak bones!
3 topics were covered in one module. The relationship of the 3 things was illustrated in such a way students could relate it to their own lives.

Most and Least Valuable Aspects of the Module and Suggestions for Improvements.

The teachers were asked to respond to open-ended questions regarding the most and least valuable aspects of the module and suggestions for improvements in the module. These are the comments in order of concern:

What were the three most valuable aspects of the materials and why?

1.

Easy to find, borrow, purchase. (common items).
Students often are weak at reading charts and graphs and this got them involved in using those tools.
1. The data: Having actual experimental data, helps to have students construct their own understanding. 1. Cooperative learning: Students can learn
Background information on the various topics - if you add them to your website students (and parents) would be able to check it out if interested.
The hands on activities ie: Past was great because it allowed students to create a model of what they read
1. Transparencies
1. I enjoyed the scientific nature of the studies. This is valuable in getting the students to use the scientific method in investigations.
Change for the students - new material rather than the textbook.

2.

Directions/Instructions easy to follow/understand.
Anything involving a study of the body fascinates middle school students. This was not exciting material, but it was thorough and scientifically accurate.
2. Website: well done here. They are to the point and show what they intend to show. 2. Demonstrations: They were relevant and to the point.
They allowed for group work and discussion
Bath tub model of bone stasis - great for understanding concept.
Websites - they always provide hands on visual displays.
2. Background information for the teacher. It saved me time looking things up. I learned much from reading it.
2. The engage activities were wonderful. The ones at the beginning of the unit with the skin, bone and muscle got the students going!
Web components were great.

3.

Anatomy of a kick program was easy to access, navigate, and understand.
3. The scientific method: The suncheck timers and the experiment the students perform are a great reinforcement of the scientific method. 3. Teacher materials: Nicely done and in-depth.
Animated muscle "man" on website - very engaging and useful to understand how muscles work together.
Use of other subjects ie: math, geography, writing etc. Makes the materials Multi-disciplinary.
3. Anatomy of a Kick website.
3. The experiments engaged my students for more than I expected. I was surprised by the number of questions related to the studies they brought up.
Prep time and time constraints for field testing. I realize this wouldn't be a factor in the future.

What were the three least valuable aspects of the materials and why?

1.

Shining the light on skin web-based activity was easy to access, but difficult to navigate and understand.
NSE standards - I don't need them (private school)
Teacher background too wordy
1. I had difficulty getting SunCheck timers.
I have a hard tome working from scripted material. For the field study I realize I had to and could not vary what I do, but normally I bring in a lot more into my class. For example, models of bone and muscle, x-rays showing fractures, etc.
All of the information was great some was just very minimal. I think the students would have benefited more with a little more background information.

2.

Boiling all that chicken to get leg and wing bones for lesson 2.
None
Lesson 1 - seemed too long for an introduction.
2. Unable to visit website for lesson 6 because of sun check timers.
1. The lesson on osteoblasts and osteoclast (lesson 2) was little too difficult for my students. I think if they could simply explain the role of calcium and collagen in the health of bone they would have been on the mark.

3.

Can't think of another one.
Lesson 7 - seemed too long for an evaluation - next time I would condense the time spent on the outline and give more time for the brochure.
More hands on for lesson 4. Thank you for the experience!
3. Students didn’t seem to be too interested in lesson 6
2. If there were a CD Rom with the website information, it would be beneficial to schools like mine that are technology challenged.
More web components. The students really got a lot out of those particular lessons. Some clarity on lesson 6 part 1.

Please provide two recommendations to improve the materials.

1.

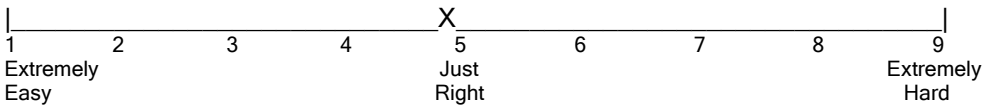
Provide a more complete data bank for "Shining the light on skin"
I will repeat what I have said before. Material and lessons need to be more inquiry based and interactive.
1. Lesson 2 needs to be worked on a bit more. The pasta analogy doesn't seem worth the effort.
At the end of Lesson 3, I felt the picture of the dinosaur should be discussed or shown before they actually draw it.
Keep gathering data for the suncheck. Website - get 1,000's of data points instead of 15, so the reports are more useful (send us sunchecks and specified times of day and months you can't conceal - we'll get the results.)
1. It should have a list of materials for entire curriculum listed on one page. I did know of advanced preparation for lesson 1 but not for lesson 6. I was frustrated trying to obtain materials for lesson 6. I think a Suncheck timer should be included.
Students had a hard time getting any data. Overall, great unit of study. It would be great as a supplement to Bones, Muscles and skin. Students needed more information for a better understanding.

2.

Provide a "generic" data bank. (Ex: how long can you stay in the sun w/o sunscreen in NM in July?)
2. The skin module doesn't seem to fit well with the other two systems. Perhaps change the unit to separate it.
On the Suncheck lesson, I liked the web page but students became frustrated when the hypothesis kept getting rejected. Perhaps offering some "testable" hypothesis on the web page that can generate a report.
Get info on professional sports training schedules - kids wanted to know how the professional athletes keep their muscles in shape during the off season.
2. Homework suggestions should be improved.

Overall Student Results.

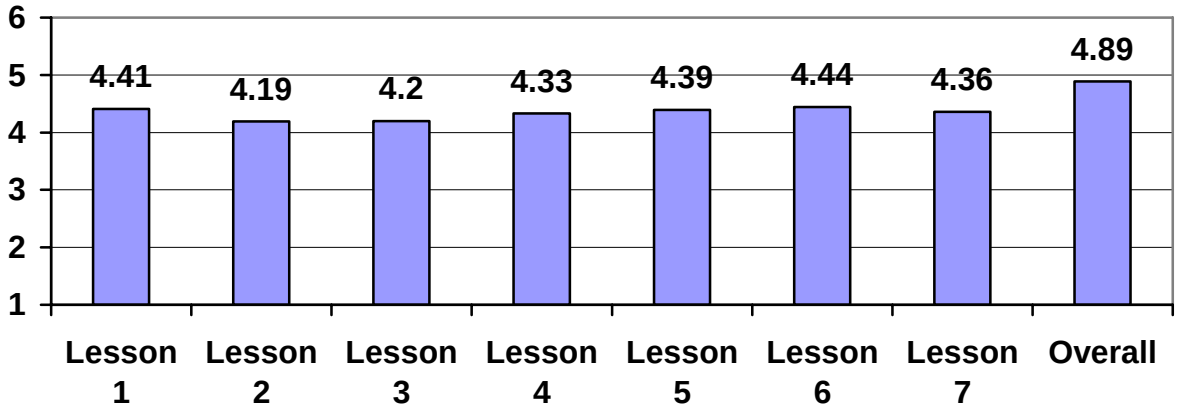
Overall Module Difficulty.
The students were also asked about the overall difficulty of the module. They rated the difficulty on a scale of 1 to 9 in which 1=too easy, 5=just right, and 9=too hard.
The average level of difficulty was 4.89, std. dev. = 3.17.



Lesson Comparisons on Level of Difficulty from Students.

The lessons each have scores from the students on several dimensions. Table 62 depicts the mean difficulty scores for each lesson. All scores were slightly below the ideal score of "Just Right" (i.e., 5). This indeicates that difficulty levels are appropriate for the grade levels tested.

Table 62. Comparison of Lesson Levels of Difficulty: Student Results



Most and Least Valuable Aspects of the Module and Suggestions for Improvements.

The students were asked to respond to an open-ended question on the most and least valuable aspects of the module and suggestions for improvements in the module.

Overall, what three things did you like most about the supplement and why?

I liked it because it was fun and we got to learn more science and we got to work together.
1) I liked the use for loose it lesson. 2) I liked the decisions today for a healthy tomorrow lesson. 3) Anatomy of a kick lesson. 4) What makes bones stronger lesson. 5) Is it alive lesson. 6) Helping the body to build stronger bones.
I liked going on the computer putting the bones in order from which moves first and I liked the pasta experiment.
It was fun and educational at the same time. It gave me a lot of ideas on how to take care of my muscles, bones and skin.
I liked lessons 1, 2 and 3 because they were hands on experiments.
The skin making Vitamin D, looking at meat and the other projects.
When hearing about the rats because it's cool learning about how the rats trained to improved their muscle mass.
It made me think about bone, muscles and skin more. It helped me understand things about our muscles and skin.
I liked when we did the pasta because we got to see how muscles are build. I liked when we went to the lab, we got to do the game on the computer about bones and muscles.
I liked lesson 3 because it was fun and challenging. I liked lesson 2 because we were seeing how bone links and was compared to another bone. I also liked lesson 1 because we were comparing a living thing to anything.
I liked that it help me understand more about the bones, muscle and skin. I had lots of fun and it made me think.
When we went on the computer, when I saw the bone and meat and when I did that actually when we had to put the sports in order because it was fun.
Things I liked about the supplement was it was easy, fun, taught me new things and it was interesting.
The lesson was very interesting, made us think about our health and how it would be if we don't do exercise. That some of the lessons were challenging and we got to learn more about muscle, bones and skin and that we got to understand how bones, muscles and skin react, move and how it is made of.
It made me think, I learned something and I had fun.
1) Soaking pasta 2) Sun-check 3) The rat experiment
The spaghetti experiment was cool.
1) The chicken meat 2) The rat study 3) The human study
1) Hands on 2) Hands on 3) Looking at real stuff
Working with pasta because I like making a project with Becky and we both liked working with bones.
1) I liked the sun checks 2) Hanging scissors in or off the things. 3) The orange juice and milk thing. They were all fun and interesting.
Reading about the tests on rats, seeing the spaghetti look like bones and the sun check project
1) Reading the memo. 2) Getting to talk about rats. 3) Not a lot of work.
1) Making an experiment for the UV sun check. 2) Overall, lesson 4 3) Comparing things in your body to everyday material.
Learning about bones, skin and muscle.
1) Interesting experiments 2) I learned a lot 3) Cool experiments
1) The computer 2) The computer animation 3) Changing the computer animation.
1) I liked when it was hands-on 2) I liked the interesting things, like the skin lesson. 3) I liked doing things we normally would not do in science class.
The rat experiment, SunCheck report and kick website
1) Lesson 7 2) Anatomy of a kick website 3) SunCheck monitors
I liked the kicking thing on the web, I liked the spaghetti, I liked the bone chalk thing.
The SunCheck report because I worked in group.
The bone, the spaghetti test and the bones on website
The rat examples, I am not sure why though. The other examples worked for me. The website was a good help.
I liked learning about how diet can affect muscle, skin and bone growth. Also, I liked the spaghetti experiment and the SunCheck experiment.
The SunCheck thing because it was active. The spaghetti because it was cool to see what would happen.
I liked the animal stuff because it was fun.
Lessons 6, 2 and 3
1) The bones soaked in vinegar, water and something, I can't remember. 2) Spaghetti and rubber bands 3) Discussion.
I liked ball kick, spaghetti and bones and the SunCheck
1) SunCheck 2) Kick 3) Spaghetti
The website, SunCheck experiment and Lesson 7
1) The SunCheck project 2) comparisons 3) The rat study and no homework
1) SunCheck Lesson 6 2) Pasta, Lesson 2 and 3) Lesson 5
1) Reading the memo from Lesson 7, it was funny. 2) The rat talk, it was fairly interesting 3) No homework from these lessons. Except Lesson 6.
I liked anatomy kick because it was cool to see skeleton man. I liked "alive or, is it", it was cool to see different things and show differences. I liked how to make strong bones with the osteopath and class.
I liked studying the rats and I liked Lesson 1 and the SunCheck.
SunCheck, pasta and It's Alive, or is it?
I liked the SunCheck sticky one because I learned how to prevent sunburn and about UV. I liked the kicking activity because I learned how paleontologist know what dinosaurs muscles looked like from the bone and which way it would move. I liked the pasta experiment, It didn't work very well, but I liked watching it.
Food
I liked Lesson 5, use it on or loose it, I liked reading about the rats, deciding how the rats would be after and that I got to learn a new muscle in rats.

1) The noodle day: seeing how similar things are. 2) The decisions today for a healthy tomorrow, the boxes were fun. 3) The computer actions thing, it was cool to see how everything works.
1) SunCheck: fun experiments 2) Pasta: fun to put things (food) to represent materials 3) Rat thing.
I liked the experiments
They were interesting and we participated in most of them.
The studies brought up were informative and interesting. It was a fairly quick lesson so we learned large amount in a matter of days or weeks. Having the different classrooms and network to share results is an effective way to share information.
I liked the sun patch business because we worked together as a team.
1) Lesson 5: Interesting example 2) Lesson 4: Interesting data 3) Lesson 6: I liked working with sun patches.
1) The ball 2) Spaghetti 3) Pasta
1) Learning new things 2) Eating the left over pasta 3) I don't know
1) I liked the SunCheck because I thought that it was good way to show how UV light affects skin. 2) I liked the website that showed you how a kick works because it was helpful in showing how the muscles worked. 3) I liked the pasta and rubber bands because I thought it was a good way to show bone strength.
It was fun, I liked the animation
1) I liked to learn about the muscle, because I learned that you need two muscles to contract or relax. 2) Learn about skin because it was fun, learning that the darker skin the better and the UV SunCheck 3) Bones: because we read what's better, orange juice or milk
The sun experiment because it was fun to work with other people. The kick website and the rat projects because I like rats.
I liked going on the internet and studying the muscle effects of kicking a soccer ball and learning about chicken skin and other strength of the bones.
The SunCheck timers, the chicken skin and the computer soccer kick.
SunCheck timer, Muscle bone website and soccer kick
The lose it or lose it. The today for Healthy tomorrow and I liked going on the computer.
I liked the one with meat. I liked to work on the computer and I liked the bone one.
I liked that we could see how our muscles worked in our leg and it was fun.
Soccer kick, Lesson 3, What makes bones strong on Lesson 2 and Lesson 7
I liked going on computers and barely writing anything
I liked the models, I liked the stuff we used and the weights
The SunCheck, muscles and bones and the kick a soccer ball
1) Was when we tried to figure out the thing 2) Was when we were doing the lesson 3) Was when we were attached to the lesson
I didn't like it
Learning about the rats and what they can do when trained.
I liked doing the website and making the graph
1) The examples 2) Time and how quickly it went 3) Explanations
Learning about skin care, learning about eating and drinking properly
1) Learning new things about my bones 2) Learning to protect my skin 3) That muscles work in pairs
Bones are so strong, muscles have to do a lot of work and your skin is stronger than I thought
I liked how they taught us bout bones, skin and muscle
I didn't really like anything but the rats!
1) It was easy to understand 2) Not boring to learn 3) The graphs 4) The website
I liked to learn how bones, skin and muscle works.
Seeing the bone that could bend it was weird, nothing else.
1) Rats 2) Website 3) Cary's knee
1) Fun and learning 2) Interesting material 3) Learning new things
I liked the rats, Lesson 5, Lesson 2, Lesson 1 and Lesson3
I liked the examples, explanations and time
I liked learning about how it is not healthy to have tan skin.
Easy to understand and fun to learn it
It was easy and interesting
1) Learning about bones - I had no idea 2) Learning about muscles
I liked learning about muscles, bones and skin
Chicken skin and chicken bone
1) Seeing that orange juice also helped bones grow 2) Knowing which exercise was best for the development of your bones 3) Hearing that rats lifted weights
I enjoyed the visual, graphs and websites
The skin to paper, bone to chalk experiment. The spaghetti experiment and the bones soaked in vinegar, water and bleach.
1) Website 2) Chicken skin 3) Paper
I liked learning about bones the most because I have a broken bone and I want to fix it.
The gooey bones! The rats with weights going up the ladders! The sports (which one was the strongest bones)
I thought that it was interesting learning about how you could keep healthy bones.
I liked the experiments and the examples, they were easy to understand.
1) The rat experiment 2) Learning about bones 3) Learning about muscles.
1) Bendable bones 2) Chicken 3) Lab
1) Visual helps you learn 2) It taught you stuff 3) It was short, sweet and to the point which is good. It helps you learn more.
Examples: Fun to watch and each day had it's own lesson
I liked all the different examples we had and how we could relate our own bodies to most topics.
Enjoyed the group activities that we were told to do, rat lab and skin, bone and muscle.
The soccer kick and the rat ladder lab.
1) The examples 2) Experiments 3) The bones
1) stories from the lesson were interesting 2) it was nice to have visual and participation of the students was fun.

1) The computer program with the muscle man kicking the ball was fun because you could see what was happening. 2) The rat resistance experiment 3) How everything fitted together
I liked learning about the different exercises that help your bone density. I also liked learning about the bath tube related to the bone.
I liked learning about muscles, bones and skin because it interested me! The bones were especially interesting.
1) The experiments-because they were interesting 2) The visuals-because they caught my attention and me think. 3) The hands-on learning activity-because I could experiment what we were learning.
1) I liked the part about the analogies/the spaghetti with rubber bands showing how flexible it was. 2) I liked the discussions about skin cancer 3) I liked the rat experiment and learning about it.
1) I liked the examples, whether survey or something else, because they made it easy to understand what the lesson was trying to say. 2) I liked learning about each system or part separately, rather than all at once, because it made it easier to see what each did without any confusion. 3) It was fun to learn about what each part did for us and what happens from outside forces.
I learned a lot
1) Activities were interesting and fun. 2) Taught a lot of new stuff that I didn't know before.
1) Anatomy of a kick 2) Milk versus orange juice 3) Use or Loose it
1) The examples comparing skin to paper and so on. 2) The bath tub - although hard to understand 3) What happens to the bones
The rat stuff because I understood it.
1) The bath tub experiment 2) What happened to the bones in the different solutions 3) Comparing muscles, skin and bones to other objects.
Stories and lesson were interesting. Visual aid good and participation was good.
I liked the examples, website and charts because they were easy to understand and I got to see the things instead of just hear them.
I liked the bath presentation, the mouse worksheet and learning what bones were made of.
1) It was interesting 2) I learned new things 3) I liked the visuals, they helped me understand the material.
Learning about muscle growth because for guys it's important learning that bone and skin are both alive and I thought it was cool that muscles only pull.
I liked that overall the lesson got to the point and was easy to comprehend. I learned that more about my insides and will take a new look at things. I also liked how the exercises were simple and not too complex.
It was very simple to understand, the examples were interesting, it was fun not boring
The spaghetti noodles and seeing the bones
Going to the website, looking at hand outs and making the different kinds of graphs.
First three lessons, they were the most interesting and there was no homework.
1) Getting into groups - easier to discuss things 2) Transparencies - helps you understand things more 3) Discussing as a group - easy
1) Examples and experiments 2) Sun changers 3) Spaghetti
1) Easy 2) Interactive 3) UV testing
When we did stuff and not just listened
I liked all the examples! I could understand ok, the sheets were pretty easy
1) Working with partners 2) Demonstrations 3) Going outside
You can do some things with partners.
The activities were fun and interesting.
Examples, they were fun
I liked talking and discussing with other people.
SunCheck, Bundle of Collagen and the website, they were all fun.
The internet, the hands on and learning.
Everything, I didn't have 3 favorite things.
1) Visual examples 2) Teacher explaining 3) Working with partners
1) The activities 2) The demonstrations 3) The group activities.
Websites because the computers are fun and the sun part things you can get your hands on.
1) Using the websites and I liked everything.
We learned about different things everyday so it didn't get boring.
I liked learning about how they move, work and what they are made of.
1) The eggs 2) Working with partners 3) The sun thing
1) It was easy to follow 2) It was interesting 3) I liked the anatomy of a kick
1) Partners helped 2) Computers 3) Experiments - see and touch
1) The websites - made it fun 2) The sun sticker experiment - hands on 3) The studies - they were interesting.
I liked the eggs, going on the computer and putting the sticker outside.
1) The stickers 2) Using the computer 3) Demonstration
The kicking
All examples, they made things easier to understand.
The computer and outside were fun.
I just liked everything
I liked the sun shine one with stickers, they were fun.
1) The stickers 2) Using computers 3) Demonstrations
Website easy to learn and understand
1) The learning 2) The examples 3) The activities
I learned knew things about myself and about chickens and skin, bones and muscles.
I liked that stuff
Nothing in particular
The website was very interesting and the things I learned.
I liked the computer and experiments
The computer because it made it more interesting.
Stickers
Everything

1) All the experiments 2) No home work 3) Going outside
1) holding of weights on pasta because it was fun learning 2) the rats lifting weights up and down ladders because if you think about it, it's pretty funny. 3) the posters & presentations because I love to color and decorate.
1) Weighing the noodles with washers 2) The bone material content of each group 3) The SunCheck timers - figuring out that certain things burn easier
1) computer - fun 2) rats - fun 3) activities - fun
1) computer 2) activities 3) rats were all fun
1) The pasta, because it explained it more than words can imagine. 2) The sun timers, because it showed us what we should wear 3) The last lesson, because we put what we learned altogether.
Muscles, it was easy, Bones and going on the computer
Computer and learning how to get strong
1) I like the project 2) the website 3) learning new stuff
SunCheck, rubber band and chicken bones
1) SunCheck timers 2) pasta 3) bones, it was hands on
Time checkers, what makes strong bones and Alive or is it lesson. I learned a lot from them.
1) The websites, because they were somewhat interesting 2) The activities, because we got to do something 3) Posters, because it was fun
It taught me a lot
The pasta and the weights cuz it was fun. Good learning experience Lesson 3 I learn how people kick a soccer ball. Lesson 7 sharing the info proved what I learned
It wasn't as boring as I thought it would be, the activities and nothing else.
learning about muscle, skin and bones. I find them interesting.
1) I loved doing hands on activities using different items. 2) I found working on the website was interesting. 3) I really learned a lot about exercise, bones and muscles that influenced me to make good choices for the benefit of my future.
1) Lesson 1 2) Chickens 3) Posters
The activities; pasta, computers and chicken bones
1) The project - it was fun 2) Lesson 1 - I like chicken bones 3) Lesson 3 - the website was fun
1) project - it was fun 2) using the cows, It's not very often you can use them 3) putting washers on the pasta, it was really fun
noodles, it was fun and the sun timers, interesting
Going outside-because the activity was fun. Some of the worksheets-because they were fun and helped explain things better. The pasta experiment-because I learned about our bones.
1) Spaghetti - blew everywhere 2) No homework because !!! Got to draw
1) Lesson 2 - using pasta 2) Lesson 5 - learning about our muscles 3) Lesson 4 - making posters
1) Hands on 2) health fair project 3) Sun things
The sun timers because I just did.
1) Presentation-I love talking in front of a group 2) Spaghetti noodle - it's a fun activity 3) SunCheck - it's fun
Project, learning new stuff and websites
The experiments, The presentation of information and the engagement of minds.
1) making health fair projects 2) doing the pasta and weight project 3) anatomy of a kick
The activity in lesson 2, the project in lesson 7 and going on the website because it was something I could do and see.
huh? What supplement?
That you learned a lot, no homework and you just learn it in class.
Lesson 2, Lesson 1 and Lesson 6, they all had fun activities.
1) the website #1 because we had to figure out which muscle works first etc. 2) the experiments with the sun timers 3) the mouse, how they figure it out.
projects, outside and computer
everyone of the activities
1) Hands on 2) Not extremely hard 3) Fun
1) sharing projects, the projects were very interesting 2) the pasta experiment, it was fun
1) cows - websites 2) chicken bone - breaking them 3) finishing project - I passed it
1) the health fair 2) visiting the web for the soccer website 2) the SunCheck things
I liked that I learned a lot of things, I liked making my brochure and I liked using the pasta and rubber bands model.
What's the supplement? Make questions easier to read.
The decision today for a healthy tomorrow because I did.
The noodles, because it was fun breaking them. Poster, because it was easy. The skin thing, because we got to go outside.
Going to the website, doing the project and examples we did
Poster, websites and sun dials
1) I liked doing project on the computers 2) I liked doing the healthy project 3) I liked experiment with that shirts and stuff.
1) The pasta experiment, because it was fun 2) I learned how bones can break 3) The lost it or use it was interesting.
the project was easy, the website and what happens when you work out.
I don't know
1) the spaghetti activity because it was interesting 2) learning how different sport affected you in different ways, learned what I was doing for my bones 3) the SunCheck timers because it was fun to do.
1) using the pasta and estimating the amount of washers they could hold 2) when the rats were used because we don't get to work with rats very much 3) when we made the poster
Some of the materials were pretty, the pasta activity and comparing together.
Go outside, staring at sun, playing on computers
Doing the projects and experiments
Internet
Making the poster & learning about muscles
1) the project, it was interesting 2) the first website gave me thought 3) the pasta activity was fun

1) lesson 7-making the project 2) lesson 2 - experiment 3) hands on experiments & examples & websites made it fun
It was fun to do
I liked the activities because you got to be involved. The information was pretty helpful, I got a lot out of this module.
Project, activity and rats
1) Websites, it was fun 2) noodles did weights - it was fun 3) the poster, it was fun
Sun timers, it was fun
1) Most about it was on bones, muscles and skin that we did a project was fun!! 2) More about it on pasta was it was fun to put weight on spaghetti. 3) Most about it we went outside to do a sun screen.
Breaking bones - we had to use muscles and pasta - it was exciting
SunCheck timers, noodles and rubber bands, poster because they were activities that enabled us to get up and out of our seat.
1) the poster 2) the kicking activity for the website 3) the shining the light on the skin website
that the projects were easy
How we did a lot of the activity
1) chicken bone 2) pasta 3) project
(Les. 7) the project. It gave us the most hands on experience.
Making the posters because it was fun. Breaking the pasta because it was fun to watch it break. Watching the timer change because it was neat.
The sun activity, pasta activity and the websites
1) easy way to get A+s 2) hard to fail 3) hardest thing to fail
1) The activities made it fun 2) good time of year to teach this 3) It was interesting because now in our age we can relate to this
1) working on the computer the first time 2) the pasta activity and 3) comparing the thing together
Computer, pasta and sun checkers
No homework, projects and some fun
Making partners, pasta experiment and Sun thing
Lesson 2 activity & lesson 6 activity and the anatomy of a kick game.
What to eat to stay healthy. How to maintain healthy bone. How to stay healthy.
Mice, muscles and when Billy came back!!!
1) going outside 2) feeling the bones 3) making the bones and testing them with washers
Websites-it was fun, SunCheck timers - it was fun and poster, it was fun
Computer, project, going outside and activities (bone one)
1) Lesson 1 hands on materials 2) lesson two hands on materials 3) how easily it was learned
Websites, posters and the info because it was interesting
Doing experiments, drawing the posters and learning how many bones and muscles are in your body
The bones, muscles and skin
Posters, computers and spaghetti
it was things that we should know to help keep our body healthy
The project when we went on the computer
pasta and weights-fun, rat experiment-fun and outside experiments-fun
Posters, skin check and chicken bone
The website about kicking, the activity with the noodles and the activity outside.
breaking chicken bones, breaking pasta and C.O.W.S.
1) the posters, 2) the kick site 3) the other site
My favorite thing was lesson 2 because I like breaking the pasta
the activities
The hands on activities, the project and the computers. I liked the activities because it made everyone gets involved. The project because it was fun and the computers because it helped me understood.
The SunCheck timers, the rat story and the project
Making the brochure, the "sun" watches and that the lesson usually challenged me. Also, the soccer website!
no notes, got to get on the computer
The posters
The internet because we got to explore. The COWS, got to do something different
1) The pasta experiment; I thought it was really fun because you didn't know how much weight it could hold 2) The bone experiment. It was just something different 3) The posters because it was fun.
Comparing in Lesson 1, going outside and comparing UV ray protection and projects.
The weights, because it helps understand how much weight your bones can take. The project, it helped me to why you need exercise. The chicken bones, it helped be saying if you do the wrong thing for your bones they will break down.
Lesson = 7, 4, 1. The poster, the worksheet and working together. No homework.
Learning how skin, bone and muscle are very important - because I never known this much now. Skin cancer - now I know what to do to prevent cancer from happening. What they do with the rats.
It was cool, fun and interesting.
We got to use laptops because I like to use computers. The pasta experiment because our bundle held 4 washers.
I liked the project because it was fun and they were hands on.
1. activities 2. making posters 3. going on computer
Lesson 7 was interesting. Lesson 6 was cool. Lesson 1 was very interesting.
The poster it was fun. Sun watches, they were cool. Finding out how muscle mass was measured it was interesting.
Working on computers I like the computers
Pasta - fun. SunCheck, bones
Doing the activities lesson 7 and 2. using the computers lesson 3,6. finding out about things
Websites fun. Projects fun. Stories fun
The sunscreen meter things. Picturing rats exercising. The kick website

No homework. You don't have to do projects outside of class. It was simple
I liked all the projects and all of it
No tests, we got to go on websites, activities outside.
Playing with the bones, presenting, making the poster
When Billy came back, muscles and skin
the pasta because it was fun, the websites because it was fun and making the posters because no homework.
The activities, the end project, the pasta activity and SunCheck projects.
I like to learn how to do things to help me in the real world
Poster, outside activity, soaking bone activity
Learning how muscles & bones work and how too much sun can give you skin cancer
bone's strength, muscles strength, skin, it was interesting
Pasta - we got to play, Bones-we got to have fun, Kick - we got to use the computers
We got to go outside and stare at the sun
1) The pasta lesson 2) The kicking lesson 3) The websites
1) Sun timers 2) Health Fair thing - making it 3) Making bones with noodles & seeing if their strong with washers
I like the skin, muscles and bones because in skin and bones we went out for a walk and looked at a timer that was for our skin. For bones, the website of the soccer player and for muscles the movement of your arm. I learned a lot.
Everything, because I really did learn about skin, muscles and bones
I liked learning about my bones because it would be really nice learning on how my bones work and what I can do to make them strong. Same thing with the muscles. I like learning about the skin because it is really cool learning what makes us get skin cancer and why there is always dust in the house.
1) Studying bones - I understood more 2) The advertising - it was fun 3) The muscles helped me understand more about muscles.
Drawing advertisement - It was fun. Weighing the pasta - I didn't think pasta was very strong. Going on the internet - The man on the screen was funny.
The muscle lesson, because I am interested in muscle. The rat experiment, because it was interesting and the strength one because it was exciting.
The poster, because we got to draw and color. The website, because we got to get out of the classroom. When we were cutting the muscle, skin and bone because it was cool.
Bones, because some things I never knew. Skin, because some things I never knew too. Muscles, because also I didn't know some things.
I like the bones, muscles and skin because it protects our body.
1) Learning about UV ray and the color of your skin matters 2) The projects because they made learning easy. 3) The website was ok seeing the muscles up close.
I liked that we got to draw, compare and do experiments.
Skin, muscles, bones because it is about the body
We got to learn about our bones, muscles and skin and we probably didn't know that dead skin falls out and our muscles tighten when we put our arm down.
Know about your skin, the muscle and the bone because it was very interesting.
It was interesting. It provided good information. It provides a basic understanding of the anatomy of a human.
The rats, because their cool, the amount of muscle increase from sports, soccer was the second and the sun lesson, because the sun is interesting.
The poster, the bone experiment and the skin lesson because they were all very interesting.
1) The website, it was fun to go on the computer and look it up 2) the model experiment 3) the bath tub sheet.
1) It was easy 2) Not a lot of homework 3) Graphs and websites to help us learn.
1) using the computers - technology is the future of science 2) doing this in groups - helps build social skills 3) hands on - gets students more involved, makes it fun
1) The labs 2) The websites 3) Learning about muscles
Getting together in groups, Trying to figure out the answers for the chart
Reading was the only fun I found and was interesting.
The website, the discussions and the mice projects
Doing the experiments because it was fun to get the experience. Making the pasta because it was fun.
You got to learn new things. Got to use your hands in some stuff. Didn't have to read out of a book.
learning about exercise, bones and muscles
It was fun using interactive materials such as the internet. Learning about how muscles relax & contract. I liked filling in the rat's charts because I like graphs.
Posters, sites and overhead because we got to do the work.
1) I like how we learned something new 2) I like how we got to use the internet
Collagen (what it does), muscles and bones
It was for the most part very hands on
The websites & the charts. The challenging materials.
The website because it help understand and the activities.
It took long time. Making the brochure and having fun.
I liked doing the poster for bones, muscles and skin, working in groups, and the examples.
1) About muscle, skin and bone because it was fun. 2) Learning about calcium and collagen, because it is easy to learn. 3) Getting to know about how different things work together, because it was interesting.
I liked when we learned about: Anatomy of a kick, Use it or Lose it, shining the light on skin because they were so interesting.
I liked all the activities because it made the lessons more fun. I liked learning about new things about our body because some things didn't know I had and it interests me. I liked reading about the animals because I didn't know their bones grew so much.
1) The lesson had <u>some</u> things I didn't know. 2) The whole lesson, <u>entirely</u>, was great and had many details. 3) This had internet sources which made the article more interesting.
Doing projects and experiments, learning more about our body and doing commercials, because it was fun.

I could understand everything, the lesson was interesting and last I could read it easily and because everything was pretty simple.
I liked lessons 2, 3 and 4 because they were very interesting.
1) I liked a lot of the examples, because they helped understand it. 2) I liked a lot of the activities because they showed me what they meant. 3) I liked the worksheets, because I understood the things better from them.
1) Going to websites 2) Anatomy of a kick 3) Learning about bones, skin, and muscles.
I liked doing that brochure
Decisions today for a healthy tomorrow because of the three things I learned. Helping the body build strong bones. Shining the light on skin.
I liked learning about these things, learning how exercise affected them and making the project.
Going on the internet, I like surfing the web. Creating and acting the skit. Using rats, better than using humans.
1) The examples that helped me understand more about bones, skin and muscles. 2) All the lessons and graphs 3) The graphs about if I agreed or not because you all let me express my opinion.
I liked; 1) The commercial because it was fun to do 2) Internet sites because I like computers 3) Learning! I like to learn!!!
Lesson 7: Because it was very interesting. It didn't put me to sleep. That's basically all (all the pretty easy lessons)
Bone can contain lots of cells because of the tissue.
When we went on the computer for muscles, fun When we went on the computer for skin, fun When we did the bone experiment, fun
I liked the websites and making posters. They were all fun activities.
I liked the commercial because it made the project fun. I liked the pasta also, because that was something interesting on how the pasta could relate to a real life bone. I liked analyzing how diet and weight bearing can contribute bone mineral content because it was the easiest.
It's alive or is it. The lessons and activities
1) I liked the brochure with my partner 2) I liked getting on the computer 3) I liked the bones with spaghetti
It's alive, or is it, use it or lose it, anatomy of a kick, for they were fun.
1) you learned about the minerals in your bones 2) they used interesting examples 3) the darkness of your skin extends the length of time in the sun.
Probably the stuff was easy to understand, I liked the examples we had, I also liked trying to figure out the order on the website for lesson three.
I liked making the things to go along with the lesson and the examples used, I also liked about swimming!
I liked making the brochure, the pasta and looking at the skin; because they were <u>all</u> fun.
Learning about muscles, skin and bones, doing exercises and making the brochure
1) I liked most of all the activities. (poster, researching etc.) 2) I liked second of all, the learning new things about muscle, skin and bones. 3) I liked the way it varied and used different things as representatives for others.
I liked working with the noodles in making bones stronger. I liked working with comparing things and going to the internet.
we got to do fun activities, we got to work in groups, we used real objects as an examples.

Overall, what three things did you like least about the supplement and why?

That what did you like or don't like and if you could understand.
I did not like that there were something's I did not get and there was one part that was confusing, Lesson 5 was very boring!
I did not like the rat lesson as much because rats creep me out really bad. But everything else was very great.
I did not like the rat part.
I did not like it when it said you had to really take care of your bones, muscles and skin or it won't function well.
The other because we really didn't do nothing but talk and answer questions.
Talking, doing Math and Reading.
That the sun can make your skin tight because sunburn really hurts.
Some of the lessons was not fun.
I did not like when Ms. Holland showed us the chicken bones because it was nasty. I did not like when we did the thing about the mouse because I didn't pretty much understand it.
I did not like the math in lesson 5. I did not like that most of the lesson were not that fun. Also when we had to do it independent.
The supplement was too short. The program started too lose it's excitement towards the end.
When we had to do the math, when we had to write and when we had to listen more than we worked because it took up too much time and it was boring.
Two things I did not like was: 1) It was a bit confusing at the beginning and 2) the lesson in which we had to do math.
That one of the lesson was confusing and one of the lesson was too easy, but everything else was okay.
It got boring on the 3rd day and it was not showing enough information.
1) Filling out these evaluations 2) Reading the papers 3) Doing the same thing over and over again.
Anatomy of kick lesson?
The poster
1) Level of difficulty and 2) Not much independence
The rats dying. I love rats. I like everything else
1) Filling out these forms 2) The Dinosaur drowning 3) Write up for sun check, They were all pretty boring.
Writing about what we read and taking the test / survey
1) Some stuff was boring 2) Making the "Muscle, Skin and Bone" list at the end. 3) Needs more active stuff to do.
I did not like lesson 5 because rats are cool.
Doing the muscle and learning stuff.
Kind of pointless
Lesson 7: It was stupid, boring and was too easy
1) I disliked it when it seemed like the teacher was doing everything. 2) I disliked it when I could not tell what the point of the lesson was 3) I disliked the information that was not as interesting.
Lesson 7, spaghetti experiment and poster
1) They killed rats 2) How fast we went to Lesson 2 3) The muscle (chicken or turkey, whatever it was)
I did not like the rat thing, the kids drinking orange juice and milk, the poster
Lesson 7 because we only talked
Everything else
The poster
I did not like doing work sheets or going on the website.
Doing Lesson 7 because it was extremely boring. The first thing because Larry just talked. Anatomy of the kick because we just looked at the screen.
I can't decide who likes CO? No one! Not me or anyone I know.
Lesson @@@@ 7
A lot of writing and not too much hands on
Poster
1) Rats 2) Comparing 3) Poster
That they killed the rats. We went too fast in Lesson 7. I did not like seeing the chicken skin
Doing the poster, the SunCheck write up and the dinosaur

examples / drawings.
Filling out these observation doing the same thing over and over again.
Making lists we could have just talked, some of it were boring. The dinosaur drawing.
I liked it a lot
Lesson 7, it was boring, I did not like the what builds strong bones lesson.
Filling out these evaluation, reading and listening
Decisions today for a healthy tomorrow because we just wrote a little of what we already knew. I did not like the comparing the objects on the plates because we just did obvious things like the skin is not as water absorbent as the towel and muscle was a different color that than the rubber band.
Meanness
I did not like Anatomy of a Kick! It was confusing and I just didn't get to enjoy it.
The mousy thing because that was mean, nothing else was bad in these lessons.
1) The papers 2) The thing I'm filling out right now 3) Listening (what's the point?)
Writing the report.
There wasn't a whole lot of going outside, it would be nice to.
The lesson was not bad, but more complicated theories and flat out work sheets would be more effective.
I liked everything and nothing was too hard.
1) Lesson 1: Being put on the spot when you gave your comparison. 2) Lesson 3: Having to guess which muscles moved which bones. 3) Lesson 5: I thought making rats lift weights was mean!
All
1) It was a little boring 2) Cruelty to animals! 3) Some of the lessons were too easy!
1) The study about the mice because it wasn't very hands on. 2) The study about the people who drank juice and milk because it wasn't very hands-on. 3) The grid because it wasn't very hands-on.
The fact that I didn't learn much of anything.
Anatomy of a kick - boring
Overall, I didn't like doing bones because it was boring.
There was really nothing I didn't like about these lessons.
Some you had to write a lot, there's nothing else that I didn't like about it.
I thought there would be more hands on
Ling on skin
The skin on and writing
I didn't like that the SunCheck timer website didn't have enough data
Lesson 6, Lesson 4
Writing too much - finding the answers easy
I didn't like the writing and the talking
It was all fun
None
1) Science 2) Bones and the color black
The graphs, some activities and also doing the math. The math was in a way complicated.
Use it or loose it because it was harder and boring, some were confusing
1) Sometimes the time 2) Info 3) Fun times
It was boring, not a lot of info
It wasn't as interesting
I did not like this because it wasn't interesting
1) charts 2) Graphs 3) Everything
Use it or loose it was confusing
I did not like the unit of the human body because it was gross
Nothing
Nothing
1) Confusing 2) Long 3) Boring
It took a long time. It was boring, it was easily understood but took

so long to explain.
Time, filling out these forms
There were too many work sheets that you had to fill out.
The length (short) didn't get all the info in it.
It wasn't interesting (but wasn't bad), it was confusing and boring
1) Rats dying 2) Wasting rats, just because they're ugly doesn't mean they are bad - common misconception, get it right.
Killing rats, I liked everything else
1) Seeing that my favorite sport did not help my bones the best 2) That some were very easy
I did not like rats dying and more info notes
The rat killing, it is sad!
Boring and gross
The computer lesson because the test was pointless and it was boring
Loved it all!
The experiments that they used on the rats.
It was confusing, it is sad about rats
I liked most of them
Not long enough, some things were not clear and kind of boring
It was very plain, didn't have much hands on which doesn't help you learn. It had too many stories about examinations which was boring.
Some lessons were too brief
I thought we could have found more ways to make it more interesting. Too much paperwork.
It was really fun!!
The graphs, the stories and the math involved.
Not long enough, not clear enough and not thorough
1) too easy, I liked challenges 2) the lessons were too small, need to be more detailed 3) instructions weren't clear.
No downsides to the lesson
The rat work sheet and everything not in the last question.
1) I didn't learn as much as I would have liked. It was really a short unit. 2) There wasn't much info. 3) A lot of examples, not enough info.
1) They were very short lessons 2) Some directions were not exactly clear 3) Not as much detail in lessons.
I did not like some lectures
1) It could have been nicer to see pictures of what was going on in each examples. 2) At some point, the lessons were not as the point as they could have been. 3) Some of the lessons were harder to understand and therefore made it harder to learn the material.
1) Some things were hard to understand 2) A couple of things were hard to find 3) One part was sort of dumb and boring.
Some examples were not needed. Some things too easy.
1) The rat lab - weird 2) Anatomy of a kick-boring 3) Making lists
I didn't like any of the lessons except the rat lab, one, because they were terribly boring and two, because I did not understand.
1) The rat lab 2) The anatomy of a kick 3) Making lists
Too easy, challenges help me learn better. Too short, only touches briefly on the subject. Not very detailed way more in depth.
I don't like all of the questions we had to answer because it is boring.
I did not like the instructions, the fact that it was easy and the lessons were too short
1) Can be hard to understand 2) Had no time for questions 3) The teacher has to follow the curriculum exactly.
I didn't like the quickness (5 days) of the lesson. I couldn't see things in order, it was very confusing. I needed an introduction telling what we would learn in what order.
I didn't like that there was no visuals because it was hard to imagine things. I didn't like some of the examples because I couldn't relate to them. I did not like the work sheets we did either, weren't interesting.
It was a super lesson

The lack of things learned, killing of the rats to find muscle density and it was boring
Lots of the lessons were short. Need more examples and explain directions and what we are doing.
Last 3 not as fun
Boring - no fun
1) Some parts were boring 2) Lots of papers 3) Nothing else
It was boring, we had to do a lot of work.
Everything
I was confused a lot, some weren't as fun. I didn't quite get it.
Not very interesting because nothing that was something I was interested in.
Some of the papers were confusing
The talking, it was kind of boring.
Papers were boring
Some things were boring since we have talked about some of the stuff before.
The overhead projections, the charts and the graphs.
Lectures, boring stuff. A lot of talking.
Doing the work and writing
Dino thing and the anatomy of a kick.
Overhead things, writing down stuff and nothing else
Papers
Really easy
Some were boring when you don't do anything and you just listen to the teacher.
I liked it all, they were all fun.
1) Writing 2) Doing Lesson 7 3) Graphs
1) Some lessons were boring 2) Doesn't seem our age 3) First lesson were good, last, weren't as good.
1) Filling the work sheets - don't like to write 2) Graph - was just not that fun 3) Reading - don't like to read.
1) Lesson 1 - not hands on
The lessons, the internet and filling out papers like this.
Needs more information, a little boring.
A little boring in some parts
Not sure
Nothing, cause it was all fun
Needs more interaction, little boring.
Very bored
1) The paperwork 2) The lectures 3) Nothing else
This unit was kind of boring. Didn't move around much.
Nothing really
Nothing
Talking in class
1) the w.s.'s were boring because all we did is listen and write. 2) taking notes, because we just sit and write. I like to stand up and learn 3) the computer activities were not the most exciting thing.
On lesson # 6, the computer wouldn't work - no results came back.
1) health fair - was sort of hard 2) homework - don't like 3) reading - not interested
1) health fair 2) homework 3) reading were all too much work
Picking the last project because they were all good ideas. Nothing else!
All the work and writing we had to do
Our computer broke
learning about rats, writing stuff down and thinking about the differences (Les. 1)
Poster, diet and dinosaur
writing - made me write information I knew and understood
Anatomy of a kick was my least favorite.
Bone mineral content, mice project were all boring, not interesting
I didn't like # 7, cause I can't sit or stand in front of an audience or crowd.
It wasn't very fun, it wasn't very interesting and nothing else.
the worksheets, it was long, it was kind of easy.
1) Not enough activities, but there are quite a few. 2) Maybe at time a little confusing information. 3) Maybe add some information to the website.
1) Rat lessons 2) website

the graphs, the project and cutting myself
1) Lesson 2 - had to clean up the pasta 2) Lesson 4 - It was hard 3) Lesson 6 - Made me confused
There was nothing I didn't like
the way the bones move, not interesting, chicken skin
The homework involved-because some of it took a long time and I didn't understand it. The skin website-because for me it wasn't fun and it didn't work. The muscle website-I couldn't figure out the quiz.
Computer were used - confusing, Had to bring all our books and it was confusing
I didn't like anything overall
1) Worksheets 2) writing assessments
Boring, need more activities
I like the activity, but loose some of the reading
Learning about the muscle mass of rats, writing stuff down and pasta broke
1) the worksheet we wrote in lesson 4 2) most things were too easy 3) the website in lesson 6 didn't work
The assignments, essays and the rats because we had to read a lot and write a lot
huh? What did you supplement and for what?
Homework, the worksheets were hard
Lesson 7 - making the posters Lesson 6 - the website Lesson 1 - finding the similarities between the two
What they do the mouse, I like mice. Nothing else.
projects, worksheets and writing a lot
Waiting for the timers, making the brochures, that's pretty much all
1) More group work 2) Less paper / more on website 3) Any movies?
The bone health, because it wasn't very interesting.
1) Cows - websites 2) project - I was nervous 3) Project - starting it
1) the rats activity - it was SICK! 2) visiting the website for the SunCheck activity 3) Nothing
I didn't like that the website didn't have any information, I didn't like that information I found out about using rats and I didn't like that the lessons didn't have very many activities.
Again, with the big words
The test, surveys and projects
It was all easy, it was boring and it wasn't that interesting.
Don't know
1) The homework 2) The notes and the tests
It was boring, I already knew most of the stuff. It wasn't information I think I need to know.
Homework, worksheets in class and they killed the rats.
The rats dying. I love rats. I like everything else
1) The sun website kind of confusing 2) the rat survey stupid
The worksheets
1) Some activities are very confusing 2) Some activities were not very interesting 3) There wasn't very much color in the materials.
going color blind, doing homework and listening to teacher
I really didn't like the survey and the tests.
The internet
Shining the light on skin, not having many days to do this.
The second website did not get much info
1) rats lesson - boring 2) Confusion in websites
We were told rats had been killed. We only had two days to do the project. Wasn't that interesting.
I really didn't like anything, it was very interesting.
The worksheets and the website
Sun timers, didn't like it
Don't remember
Need to work harder so we get more exercise.
I pretty much like everything except, giving my presentation.
1) making the poster 2) shining the light on the skin experiment 3) getting the bone minerals right
test, projects and notes
Not much.
1) presenting 2) Website 3) not sure
Nothing, I found it enriching for the mind and interesting.

Websites, worksheets and activities
1) got confusing 2) got more confusing 3) most confusing
Can't think of any, it was all pretty easy.
1) the second time on the computer 2) nothing else was that interesting
Presenting, website and not sure
Worksheets (hard) and homework
Worksheets and in class assignments
The lesson 4 report. It was strongly graded. Lesson 4 didn't have any activities.
That we had to answer questions
Too many boring (pointless) learning things, I already knew
1) the websites, because they were boring 2) giving presentation, because I don't like to give presentations 3) writing paragraphs
I don't know
Discussing, graph and not going on the computer
1) the websites didn't help much, 2) too many papers to keep track of 3) the SunCheck timers were kind of confusing
Nothing, nothing, nothing because it was fun
going on the internet and taking notes
Presentation, website and bones
worksheets
it wasn't very interesting
Presentations-hate being in front of class, website for kicking-boring and that's it
I don't know
The dinosaur thing and the worksheets
Messing up, stretching and going outside
Not sure
The project, not enough time to prepare
it was boring
The essays, the survey and the test. I didn't like essays because of all the writing and I didn't like the survey because it was too long and I didn't like the test because it was hard.
I liked the whole lesson
The rat study because I like rats. Sometimes the lessons didn't challenge me and I like being challenged. NOTHING ELSE!
I mostly liked it all
I liked them all
1) The muscle website - I thought it was boring & I couldn't get the quiz right. 2) The skin experiment - it wasn't as interesting as the others. 3) When we had to do the worksheets on the control groups. It was boring because we didn't do anything exciting.
Websites 1, 2 and the rat project
using rats for a model, not taking notes.
Bathtub - it didn't make much sense. Exercise - swimming, basketball, volleyball, running - need more information.
I liked it.
Chicken skin because it was gross. That we only got 2 days to work on our project it was boring sometimes.
I didn't like this survey because it took a long time and we could be learning instead. (the lessons are awesome)
1. not enough activities 2. website not user friendly 3. short lessons.
lesson 2 was confusing. Lesson 3 was boring. Lesson 4 was weird.
Trying to find out what bones do it was boring.
worksheets. Website not working
rat test - have pet rat. Anatomy of a Kick - boring.
most everything
Talking too much. Not enough homework, need more.
The sunscreen website, poster, killing rats.
The worksheets, they were hard. Homework.
none
We only got to go outside once, Notes on the board, standing up in front of the class for the health fair.
Really nothing
Boring, didn't learn much, sitting there doing nothing.
I liked everything
I liked pretty much everything. I can't think of anything I dislike.
I got confused, I was bored, I wasn't too interested, It didn't have

much fun and not much excitement
Spaghetti activity and dinosaur worksheet
figuring certain things out
Chicken skin - it was boring, Rats - it was sad, Dinosaur - It was boring
We had to go inside
1) The presentation of the poster 2) Making the poster 3) Learning stuff I already knew
1) Writing paragraphs 2) the websites 3) giving health fair presentation
I liked everything because it was interesting.
When I had to feel the stinky bones of the chicken. When I had to do the dinosaur paper because I did not understand a bit.
1) It was boring with the skin because we didn't do anything 2) The muscles were so so 3) The bones I have no comments about
Nothing, because I liked everything the supplement had to offer.
The final lesson, the bone lesson and the sun lesson because they were not that interesting.
1) The evaluation sheet waste time. 2) no tests to study for. 3) no cool text books.
The lessons were interesting, so I didn't hate anything.
I didn't like anything
1) No book to reference 2) Finding the hidden muscle those were hard to find 3) The homework because I could not reference it and I forgot some of the material
We had to test a lot of our bones and see how it feels.
Some of the stuff.
Some of it was too easy. The poster took too long to make. The makers weren't specific enough on some things.
The rats being killed, it's inhumane, how easy you can get sun burn, skin cancer and the posters too much work.
The rat lesson, the noodle experiment because they were boring.
The dinosaur sheet that we had.
1) The lessons were a little easy 2) It was basically a review 3) Our class couldn't use one website.
1) using real chicken parts - it's disgusting 2) the test rats - they never hurt anyone and they were killed 3) not having websites for all the lessons - websites are fun.
1) The work 2) The poster 3) The chart
The written homework, filling in the charts
There was a myriad of things I found that were not amusing.
The notes, charts and survey's "sometimes"
Getting all the worksheets because they didn't do anything. Filling the charts out because it was kind of confusing. Discussing because it was boring.
That we had to fill out sheets every time we did something. I didn't like the project with the rats.
doing the paragraph, poster and working in a team
I didn't like it when the teacher had to cut the chicken skin in half. I didn't like learning what sport used the least energy because all sports keep you fit. Also, I did not like writing about what I learned in a paragraph because I like to go over the subject in class and debate about our findings.
1) some of the lessons I didn't like. 2) there wasn't an activity for every sheet 3) Because it made it a little boring.
1) I don't like how short the lessons were. 2) I don't like how the lessons were boring.
The rats, cells and skin
I did not like it because it did not relate to our lives.
The surveys. The worksheets and the last lesson (7).
I did not like the way that was light on activity for all of them and it was boring.
Well, I hated the rats and that's about all
The worksheets and I liked everything else.

1) The internet, because it wasn't easy. 2) The bone mass, because it was hard. 3) The minerals because it was confusing.
There was nothing I did not like.
I didn't like how some things were worked because I didn't understand it. I didn't like the graphs because I didn't get why we were doing them. I didn't like reading that when you saw how much the bones grew in the rats you had to kill them, because I like animals and I don't want to read about someone killing some even if they are rats.
1) It wasn't long enough 2) I didn't quite think that it was for 6th grade. 3) I thought it would at least give details on both sources.
Doing work, doing work in our work book and doing nothing, because it was boring.
Nothing, I liked everything except the examples because they were like too simple.
I didn't like lessons 1, 5 and 7 because they weren't very interesting.
1) The internet activities, because they weren't easy to understand. 2) When we made the graphs, because they didn't seem to help. 3) I didn't like the experiments, such as the pasta, and the rubber band one, because they didn't work very well for me.
1) The examples 2) It was sort of hard 3) Some of the website stuff was fun but hard
It's alive! Or is it? Anatomy of a kick and Use it or lose it
Seeing some of the parts, It wasn't as fun as I thought and it wasn't very hard.
You killed the rats, they're cool. Going on the web was confusing. Everything in Lesson 1 & 2 were boring and they did not interest me.
1) The thing about did the lesson make me think about new things and questions.
There really isn't anything I disliked.
Nothing really, just some parts were boring, boring boring!
The tissue in the bone because when you jump and don't have tissue in your bones, it breaks.
When we had to read the material, learning the material and figuring stuff out on the website.
I didn't like website with the soccer player because it was difficult for me to locate each muscle and identify which one moved first. That was the only thing overall I didn't really like.
Nothing really
1) It was confusing sometimes 2) The website didn't work right sometimes.
The rest of them, for they were boring.
1) I like following things by reading, when people are telling things me things to learn, I get lost 2) it could have been more exciting 3) it was confusing.
I didn't like giving the presentation for lesson 7, I didn't really think lesson 7 was interesting, the other thing I didn't like was on lesson 3 I had trouble getting to the website.
I didn't like presenting the things that we made, but I liked the rest.
The worksheets, the student knowledge and that's all I disliked, because I hate worksheets.
It wasn't all that interesting, it wasn't very fun, I didn't like the materials.
1) having to keep all of the worksheet & information sheets. It would have been better if there were notebooks.
I didn't like using the rats as examples, and that was all that I didn't like.
It was confusing in some lessons, it could be hard to understand some info. It was hard to understand what some things meant.

What specific suggestions would you make to the developers to improve these materials?

I don't know
It would make it better if you made the lessons more fun. Like the one with the pasta, that way, we could see how it happens.
I don't have any suggestions because everything was very good to me. Thanks for asking me.
My suggestion is put lessons on the computer like the guy kicking the ball, so we could see the rat carry the weight so we could remember the lesson better.
I really liked everything. You could really use other animal for the lesson 3.
To help us learn with every chapter, have a hand one thing to go with it because it help you learn better. I have a comment about these pages, I think that we should just write about these lesson instead of this.
If we did a little biology and played games based on the lesson.
They invented a watch that beeps when the sun starts to get too hot and a new sunscreen that can last till the sun goes down and it cools.
More excitement and a little more fun.
They should write things down maybe not too much scientifically way.
I think we should do a lesson were we have to do things with our hands, like doing real experiments.
The math is not so exciting.
I would say that make sure to remember to experiment bones, muscles and skin to use for your advantage.
To make things even more fun and not to do so much writing but more time on the computer.
The only suggestions I would make to the developers is to improve these materials and to make at least one more activity like the lesson three because I think that it was the lesson that most kids liked.
For the math in lesson 5, like in a proportion way. That for the pasta experiment, make the instruction clear so we can understand it.
Give a little more example and make it more interesting.
Make them more action not boring papers.
Don't do lesson
None
Independence and Hands on stuff!
Nothing
I thought all of it was fine.
Could make the lesson more active.
Nothing
Don't make it boring
Destroy Lesson 7
Always make it clear exactly were the lesson is going and try to make the lessons a little more fast-paced and hard.
Don't do Lesson 7, for it is too small and boring.
Explain things in deeper detail
Make more hands on
Make it more hands on
Less writing
Have more hands on projects like the SunCheck or spaghetti. It makes things more fun.
Don't do lesson 7.
Make it more interesting because it was boring!
Destroy Lesson 7
I don't know
None
Explain things with more detail.
More hands on experiments like the SunCheck one.
Make it more exciting!
Less writing, more conversations and more active assignments.
Make the level harder
Put the education in it but also make it fun. I mean we're kids, we've got to like to live and we don't need a study to ruin it.

The simpler the better.
It was way too short and we didn't do much than listen about comments of the 3 types of things (bones, skin and muscles)
Make directions more clear
I don't have much, but I just wasn't too interested in it, but that's just me.
Don't be so harsh on the rats.
Not filling out papers would be nice!
Nope, your on your own.
Maybe do more outside stuff, games, etc.
Like I said; more question/answer work sheets and more complicated theories.
Nothing
Do not use spaghetti
Make it fun!
I think that the lessons should have more hands on things because although things such as the grid are helpful, the hands-on things are easier to remember.
Better Stuff
It was pretty good except for the Bones units.
On the soccer muscle lesson about kicking the ball, I would suggest making it a little more challenging.
To make things more hands on and actually do it or go on the computer or for the rats, you could send a movie and stuff.
More hands
Less papers and less writing
More stuff like more project
I think that you guys should put a little more data in the website
More data in the SunCheck website
Making more stuff to learn about
To put more technology
No suggestions
I would add more materials
1) Get a life and a decent job 2) I really enjoyed learning about bones! Thanks.
Make some activities or examples more clearer.
Make more fun like website
The surveys are weird!
Make it more exciting!
Do more computer things
I would suggest to try making more interesting activities
More interesting
More fun and make more website
There is nothing I would say that could improve this
Not have so many surveys
Nothing
To not to make some stuff confusing.
No more of these forms
I think they should make the work sheets a little bit easier to understand.
Get more depth into it not such short lessons
I don't know, more bone demonstrations
No killing of rats, you sick people. I'm pressing charges.
Don't kill rats, you murder living things. Murder chickens - I hate chickens.
none
To have more notes
Make it longer.
Show examples and kids as the examples to make it more fun and interesting.
Loved it all!
Make the lessons more fun, do experiments (not with rats)
Longer lesson
Nothing
Spice it up!
More hands on labs!!!
Some lesson should be a little bit bigger.

Less paperwork, more examples and visuals.
For the rat lab, use actual rats and test them for 16 weeks.
None
Make the materials harder so a person can become involved with the project.
Maybe a different page about muscles, skin and bones that tells everything about them.
Get better visual aides.
Much longer with a ton more info. I wanted to learn more but it was so short.
Make the lessons hands-on, clear directions and use visuals.
I think there should be more "hands-on" experiment.
If possible, get some pictures or similar items in to show what happens giving us a better view of what bad dieting or similar things can do.
Add some critical thinking questions.
Not much, but it was fun.
Make instructions simpler.
More interesting and hands-on! Too boring.
To not do it because I'm sure it cost a lot of money to make all these sheets and stuff was impossible to learn.
More interesting! (Hands-On) Too boring!
Make it harder on the anatomy of a kick, make the guy messed up and fall if you get the wrong sequence.
Have more examples.
Make the information a little more straightforward and interesting.
1) Go more in-depth in each unit: skin, bones and muscles. 2) Give the teacher more freedom with answering questions and teaching a little from heir own knowledge. 3) More visuals, examples with the chicken bones or pasta: Interactive things.
Have something I can read so I would understand
More pictures! More relations to students like us!
I think a video on all of this material would have taught us more and helped us learn more.
Don't kill rats!
Make sure what we are doing is right and the directions are specific. Less hand outs, put them more together.
It was good
Make it more fun
It was all good
Make it more fun
I don't know
More interesting
Make directions more clear
Funnier papers
More hands on lessons.
More interesting
Nothing
I liked it, perfectly fine, I wouldn't change a bit.
Not so many papers, more hands on and computer
Make it harder
Do more activities for each one.
Make the website more fun.
More hands on activity
Make it more our age.
I don't know
More hands on things.
Make more websites for interaction.
Have more activities
More computer
Make it more fun
More examples and experiments.
Make it all website stuff
More interesting
Make them simpler
More computer
Make more interesting
They need more fun activities
Have more activities with hands.
Make it simpler

You should do more experiments.
More computer activities
More websites
Make the worksheets more fun. Have some word finds or crosswords.
Make it easier to understand
Bigger projects and smaller assignments
Bigger projects and more activities
Nothing, because they made a perfect module.
Have not as many worksheets
more hands on activity, less writing
give more time for projects
Have more information for Use it or Lose it.
Not interesting, not enough activities
No. 7
More activities. Lesson seven was fun.
Make it more interesting
Make it a little more fun.
Make sure you catch the children's attention with a lesson and hold it so they will choose good decisions for their future.
I would suggest you do something better 4 the rats lesson, confusing and complicated!
Do more activities
Get the students more active in the projects
Make it more fun
Overall, I think that this lesson as fun and I learned a lot more than I thought that I knew.
Use Pencil and Paper not COMPUTER
Have more things that involve people
Do more with the activities
More activities
More activity to help understand the materials easier
More hands on activities
Nothing, this module was EXCELLENT!
working website in 6
A bigger project at the end.
less sitting and lecturing, more examples.
I don't have any
I think that Lesson 6, website was really boring. I think you should improve it.
We need to have more fun with it.
More activities
I don't have any
This was overall good, but it needs to be tweaked slightly. For one, instead of paper charts and paragraphs, put them on the website and the last, make it a little more challenging.
Lose the story about the rats
Add more activities
It was so much fun! Don't change a thing!
Less writing and less questions on the survey and more detail on instruction
Need to make it harder, interesting and exciting.
More examples
Put a little more fun into it and maybe more activities.
Need less homework, more computer work
Make it more interesting. Don't teach things like; DRINK MILK because kids in 7th grade already know that.
I don't know
I don't know
You need to take each lesson test right after you get done with the lesson! Make it fun!
Help the websites, make it a little harder, better explanations and more specific on the final project (letter no!)
Make activities more understandable and more interesting. You are very welcome!
no homework, make it more interesting
How about more labs and experiments that would help keep interest.
Less Information
Making it longer and more speed out

I think you should leave it alone and not change it because it is really good.
Make the websites less confusing! That's all! You are welcome!
More interesting, cut some info down and give more time to do last lesson.
Keep making it fun
Make it more interesting
More activities
A fun activity that let us get up.
Don't do the poster for the health fair
make less notes and less questions on the surveys, make the directions more specific
Not sure
None, except for better websites
1) More hands on - on experience = more interest 2) more homework=less difficult. 3) less serious! Lighten up! Thanks!
More fun, more activities and more interesting facts.
Try a different curriculum
Good the way it is!
Make them more interesting and a little harder to challenge us more
Better website
Don't know
More experiments
More hands on activities. Make sure the websites work properly.
Make it more fun!
Change it all!!! My teacher said it was going to be fun! I could have made it more fun and you call yourself scientists. Just kidding but no really, it was boring
Make websites more interesting and do more outside things with the sun.
More activities
More activities
I think that my fellow class mates will have better ideas than I do.
Make it interesting
Do more experiments and projects to get the kids attention
Make it more fun & interesting.
Make it more fun
Make the lesson more exciting
Make everything more interesting and fun
Put a little more fun into it and maybe more projects.
I'm not sure
Give us a bit more time to do things
Perfect
Less homework
make it more fun
Make Lesson 4 more interesting, add an activity
A bigger project
I don't really know. You probably can't change them. SORRY!
Keep it like it is. It's Good!
It was great!!!!
Make them more interesting and more exciting like the pasta experiment.
Improve the websites and make them more interesting.
Maybe you could let them to put more rubber bands on the noodles and see if they last longer.
more colorful.
Give it more "fun" like do better experiments to see how things work - don't really use websites because they didn't help me.
Do more partner work.
Make it more interesting.
More hands on projects.
More activities to attract kids interests
Make some lessons more interesting otherwise it was overall very fun.
It was all fun.
make it more fun
Take out rat test I have a pet rat.
don't have anything.
less talking and more working.

Make it fun!
No homework.
none
Create more detailed websites for the SunCheck things.
Not a whole lot of maybe more computer activities.
Make it more fun!
I can't say anything because it was great (No Problem!)
This overall project was fairly easy. It would make it just right if you made it a little harder.
Ask more about nutrient
easy up the worksheets
More experiments
less work more fun!!
Make it more fun somehow.
1) Make websites more interesting 2) do more regular worksheets, rather than writing paragraphs 3) more activities
To have more activities in it and that they could have sheets so we students can follow a book.
Try doing more activities like going to other places.
I don't know
For the skin - let us see an animal and feel how their skin differ. For the muscles, use an animal like some snake, how his muscles differ. For the bones, I liked it especially when we digged them up.
None, because the current material is already outstanding.
People might want to do the experiment.
that we get tests and we get to use a textbook and easy on the evaluation sheets.
They were all fine stuff.
I want them to make more projects.
Give other sheets to reference
Use our hands more.
Talk about it more
Because the skin could be dark or light.
To make it a little more challenging next time.
Don't do the posters and don't tell the people that they killed the rats.
More hands on experiments and more web use.
Have more hands on things.
You could make it more challenging.
Do more online stuff, make sure that teachers have all the materials.
Make it more challenging.
No suggestions
Make it more fun.
Make them more interesting & challenging. Do more activities that don't involve sitting around.
It would be cool to see a video and not do sheets all the time.
Make them more interesting by less homework and more information.
I would provide a experiment that is interactive in every lesson.
Have more activities for the lessons.
Create a textbook of some sort to help students take notes.
Nothing, everything was great
It was just fine, no improvements needed.
Teach more difficult stuff.
Just to lose the rats besides that is it's excellent
Less worksheets and more activities.
To make it a little more understandable.
Add more interesting things to the story because they were short
I would add more activities.
To do research on all of the body instead of just some of it's parts. What we could have learned is about all the body parts.
Make up more activities.
Give better examples and make us think about new questions.
Make the internet activities easier to understand.
Don't make it so hard
I am really not sure
To do experiments with the different sections, try to put some excitement to it.
Make the lesson tougher.

Make your website have a shorter address. Your website is confusing when doing experiments.
Make the lessons more hands on, than cram the information into your head!!
Make some lessons easier and make some harder.
Try and make it easier to understand.
Nothing really, This supplement is fine the way it is.
I liked it, so nothing.
I don't have any suggestions.
Explain some things more about the minerals and things.
Make lesson 7 more interesting.

Use more examples and less presenting! (And don't kill the rats!) :-)
I have no suggestions
Make it a little more fun.
Think of more activities and it would help if there were workbooks instead of all those different sheets. It would make it a little easier on the students and help to be more organized. You are welcome.
I would say nothing because everything was great.
It would be easier to understand things if you could use objects to explain what the scientific info meant.

Pretest and Posttest Student Results

Results of the Pretest and Posttest Evaluation

The evaluation consists primarily of examination of the differences between the students' Pretest and Posttest scores on a "Student Knowledge Survey". The answer categories were True, False, or Not Sure. Appendices E and F contain copies of these surveys. The students took the first Knowledge Survey (the Pretest) before exposure to the materials and the Posttest after using the materials. All students answered questions 1-22. Additionally, analysis of the "Not Sure" responses was conducted as well as the teachers' estimates of the success in achieving learning outcomes.

T-Tests.

The students' answers were scored with answer keys which yielded the number of correct items. The Not Sure responses were scored as incorrect in the initial analyses. The mean number of correct responses on the Pretest = 12.12 (out of 22, Std. Dev. = 3.06). The mean number of correct responses on the Posttest = 16.39 (out of 22, Std. Dev. = 3.08). The t-test for Pretest and Posttest scores was t=22.60, df=309, p <.001 (two-tailed).

Percent Correct.

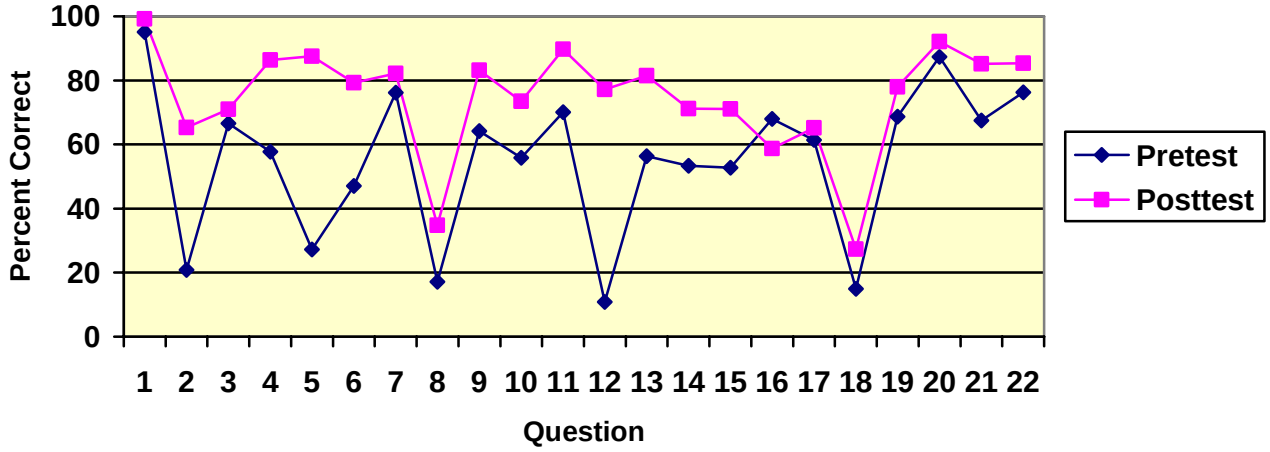
Table 63 shows the percent correct on the pretest and posttest as well as the percent of "not sure" responses.

Table 63. Pretest & Posttest Questions with Percent Correct & "Not Sure" Responses.

	Percent Correct PRETEST (SKS1)	Percent Correct POSTTEST (SKS2)	Percent "Not Sure" Responses on PRETEST	Percent "Not Sure" RESPONSES on POSTTEST
1. Living things are made of cells. (true)	95.1	99.2	2.1	0
2. Your bones are alive. (true)	20.8	65.3	18.4	6.8
3. Living things can be distinguished from a nonliving thing. (true)	66.6	71.0	21.0	9.5
4. Your bones do not contain living cells. (false)	57.7	86.3	18.9	4.3
5. Collagen is a protein that helps give bone its structure. (true)	27.2	87.5	62.4	5.8
6. The mineral content of bone cannot be changed by diet or exercise. (false)	47.1	79.3	27.9	6.3
7. Tendons attach muscle to bone. (true)	76.2	82.2	17.1	10.3
8. Muscles push and pull bones by lengthening and shortening. (false)	17.1	34.8	29.9	5.8
9. It takes a pair of muscles to flex and extend at a joint. (true)	64.2	83.2	27.3	11.0
10. Bones are affected by exercise, but not by diet. (false)	55.8	73.5	23.6	6.3
11. Exercise can help bones add minerals and become stronger. (true)	70.1	89.7	19.0	3.5

12. Jumping is better than swimming for building strong bones. (true)	10.9	77.2	34.8	6.6
13. Placing weight on bones during exercise weakens them. (false)	56.3	81.5	29.2	10.1
14. The effects of exercise on muscles last a lifetime. (false)	53.3	71.2	21.9	7.4
15. Muscle strength increases with mass. (true)	52.7	71.1	30.2	15.2
16. People with dark skin do not have to worry about getting too much sun. (false)	68.0	58.7	14.5	4.3
17. A tan indicates healthy skin. (false)	61.4	65.2	28.3	13.5
18. The portion of sunlight that causes sunburn is called infrared. (false)	15.0	27.3	40.1	27.8
19. The intensity of sunlight at noon varies with the time of year. (true)	68.7	78.0	20.4	11.3
20. Minerals such as calcium and phosphorous are important to the health of bone. (true)	87.3	92.1	10.4	4.8
21. Inactivity causes muscles to lose size and strength. (true)	67.5	85.1	20.7	5.6
22. You need muscles and bones to move one of your limbs. (true)	76.3	85.3	18.4	10.9

Table 64. Another Depiction of Pretest & Posttest Percent Correct



"Not Sure" Responses.

In addition to the analysis of the True-False answers on the Pretest and Posttest Knowledge Surveys, there is a "Not Sure" category of response. This response was offered on the survey because it essentially is a non-threatening option for students to choose when they in fact don't know what the answer is. This is entirely possible for many students because they had not yet covered the material. Correct answers are probably the result of their own reading, good guessing, or luck. We wanted to establish that it was OK to say they did not know the material rather than to guess. Table 65 clearly shows that the number of "not sure" responses were reduced on the posttest. Guessing or uncertainty seems to have been diminished substantially by using the module.

Table 65. The Reduction in Not Sure Responses from Pretest to Posttest

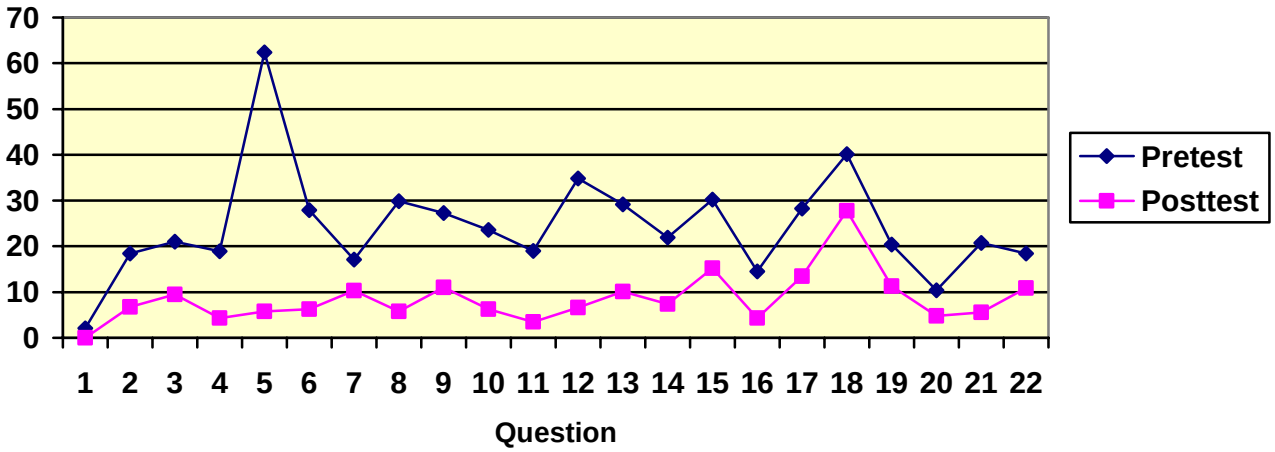


Table 66. t-Test Results for All Pretest-Posttest Questions

	Percent Correct PRETEST (SKS1)	Percent Correct POSTTEST (SKS2)	Degrees of Freedom	t-value & p value
1. Living things are made of cells. (true)	95.1	99.2	379	3.98**
2. Your bones are alive. (true)	20.8	65.3	377	16.16**
3. Living things can be distinguished from a nonliving thing. (true)	66.6	71.0	380	1.63
4. Your bones do not contain living cells. (false)	57.7	86.3	380	8.76**
5. Collagen is a protein that helps give bone its structure. (true)	27.2	87.5	380	22.69**
6. The mineral content of bone cannot be changed by diet or exercise. (false)	47.1	79.3	378	10.74**
7. Tendons attach muscle to bone. (true)	76.2	82.2	379	2.17*
8. Muscles push and pull bones by lengthening and shortening. (false)	17.1	34.8	378	5.54**
9. It takes a pair of muscles to flex and extend at a joint. (true)	64.2	83.2	378	6.50**
10. Bones are affected by exercise, but not by diet. (false)	55.8	73.5	379	6.28**
11. Exercise can help bones add minerals and become stronger. (true)	70.1	89.7	377	6.79**
12. Jumping is better than swimming for building strong bones. (true)	10.9	77.2	329	21.68**
13. Placing weight on bones during exercise weakens them. (false)	56.3	81.5	327	8.45**
14. The effects of exercise on muscles last a lifetime. (false)	53.3	71.2	328	5.69**
15. Muscle strength increases with mass. (true)	52.7	71.1	329	5.41**
16. People with dark skin do not have to worry about getting too much sun. (false)	68.0	58.7	328	2.37*
17. A tan indicates healthy skin. (false)	61.4	65.2	329	2.10*
18. The portion of sunlight that causes sunburn is called infrared. (false)	15.0	27.3	330	3.93**
19. The intensity of sunlight at noon varies with the time of year. (true)	68.7	78.0	328	3.51**
20. Minerals such as calcium and phosphorous are important to the health of bone. (true)	87.3	92.1	328	2.07*

21. Inactivity causes muscles to lose size and strength. (true)	67.5	85.1	329	5.82**
22. You need muscles and bones to move one of your limbs. (true)	76.3	85.3	328	2.87*

*=p<.05
**=p<.001

Table 67. Number of Student Scoring Higher, Lower, or the Same on the Pretest and Posttest.

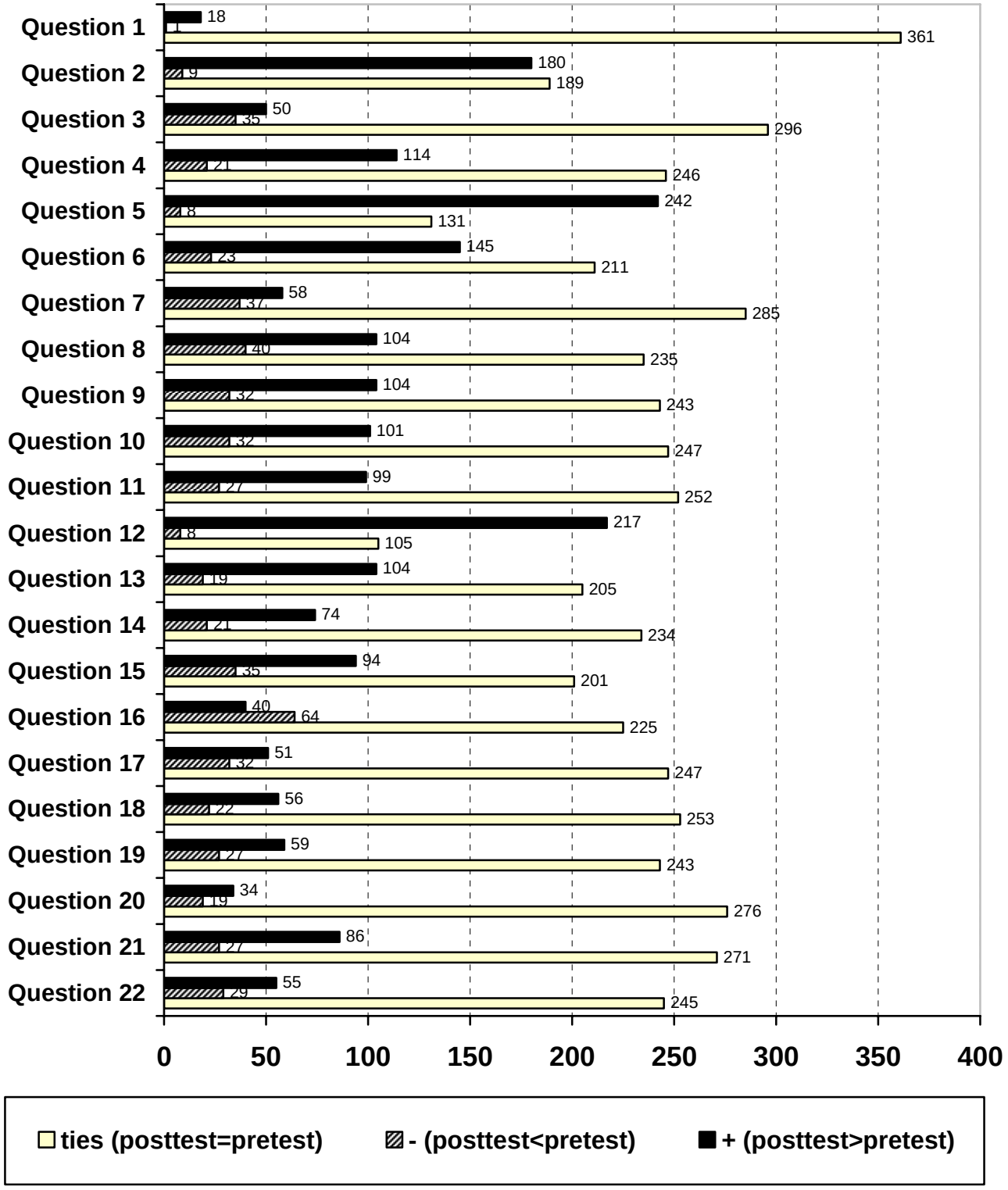


Table 67 is a graphic representation of the changes in scores by question. The solid black bars represent those students who had an incorrect or "not sure" response on the pretest but on the posttest answered with a correct response. The striped bars represent those students whose scores changed from a correct answer to either an incorrect or "not sure" answer in the posttest. The clear bars represent those students whose answer did not change. This means that if it was incorrect, correct or "not sure" on the pretest, it remained the same on the posttest.

Correlation.

It is also useful in conceptualizing the relationship between pretest and posttest scores to view them as correlates. Essentially, this view is that the higher a score on the pretest, the higher the score on the posttest, or what is termed a "positive correlation". Since the variables are interval level measures a Pearson's r correlation coefficient was calculated.

The Pearson's r for the pretest and posttest scores = .412, p<.001. This is a statistically significant correlation. Essentially, this means that when you take the square of the .412 figure to obtain r^2 you get the amount of variance in the posttest scores which is explained by the pretest scores. **This r^2 = .17 or 17 percent of the variance in the posttest scores is explained by the preexisting level of knowledge which was measured by the pretest scores.** It can be assumed that the remaining variance in the posttest scores (that is, most of it) is explained by other factors, such as exposure to the instructional materials and teaching the students have received.

Teacher Estimation of Achieving Learning Outcomes.

The pretest and posttest scores are the primary method of determining the results of the evaluation. Another input for this evaluation is the judgments of the teachers on how effective the lessons and the overall module were in achieving the learning outcomes. Table 68 (on the following page) gives the distribution of responses from the teachers. The scale is 1= Strongly Disagree, 2=Disagree, 3=Disagree a Little, 4=Agree a Little, 5=Agree, 6=Strongly Agree.

The questions the teachers were answering were related to whether they agreed or disagreed that the lessons were effective in achieving the specific lesson learning outcomes. The table clearly shows that the teacher judgments fell predominantly in the Agree and Strongly Agree range on these statements. The lowest score was in Lesson 6: Outcome 2. This score, however, is still in the Agree range. The highest score was on Lesson 7: Outcome 4.

Table 68. Teachers Judgments on Achieving Learning Outcomes.

Learning Outcomes	Mean (Scale = 1-6)	Standard Deviation
Lesson 1 Learning Outcomes		
1. Students should be able to describe characteristics of living systems.	5.22	.67
2. Students should be able to explain characteristics of muscle, skin, and bone that allow these systems to be classified as living.	4.88	1.05
Lesson 2 Learning Outcomes		
1. Students should recognize that there is a relationship between the structure and function of bone.	5.44	.53
2. Students should be able to describe how minerals, collagen, and stress affect the strength of bone.	5.44	.53
Lesson 3 Learning Outcomes		
1. Students should be able to explain that muscles produce movement by contracting.	5.22	.83
2. Students should be able to explain that muscles are attached to bones.	5.56	.53
3. Students should be able to explain that opposing muscles or groups of muscles produce movement in opposing directions.	5.22	.97
Lesson 4 Learning Outcomes		
1. Students should be able to recognize the importance of diet and weight-bearing activities to the strength and health of their bones.	5.44	.73
2. Students should be able to analyze data tables to make evidence based conclusions.	5.33	.71
3. Students should appreciate that more minerals, especially calcium, in bones makes them stronger.	5.56	.53
4. Students should understand that different types of weight-bearing activities produce different effects on the skeleton.	5.44	.73
Lesson 5 Learning Outcomes		
1. Students should be able to describe how resistance training influences muscle.	5.33	.71
2. Students should be able to recognize that animals such as rats are used as model systems in research.	5.56	.53
3. Students should be able to use mathematics to organize and present data.	5.33	.50
Lesson 6 Learning Outcomes		
1. Students should be able to use SunCheck Timers to estimate when they have received the maximum daily safe exposure to sunlight.	5.33	.52
2. Students should be able to formulate a testable question about exposure to sunlight and conduct an investigation.	4.83	.98
3. Students should be able to analyze and interpret data tables.	5.17	.41
4. Students should be able to assess the effectiveness of various types of sun protection.	5.50	.55
Lesson 7 Learning Outcomes		
1. Students should be able to appreciate the roles of living cells in the muscle, skin, and bone systems.	5.13	.35
2. Students should be able to recognize relationships among the structure and function of the muscle, skin, and bone systems.	5.13	.64
3. Students should be able to explain how muscle and bone interact to produce movement.	5.0	.76
4. Students should be able to describe how lifestyle choices can influence the health of the muscle, skin, and bone systems.	5.63	.52

Field Test Site Comparisons.

In analyzing the data it is also useful to break down differences between sampled units. Sites were selected to be in the field test because they differed in terms of geographic region and racial and ethnic composition of the student body. The primary sites received a field test orientation and the secondary site did not. The t-tests reported are paired comparisons. Table 69 contains the results of these analyses. Please note that Catlin Gable could not be included in this part of the analysis because there was a lack of data

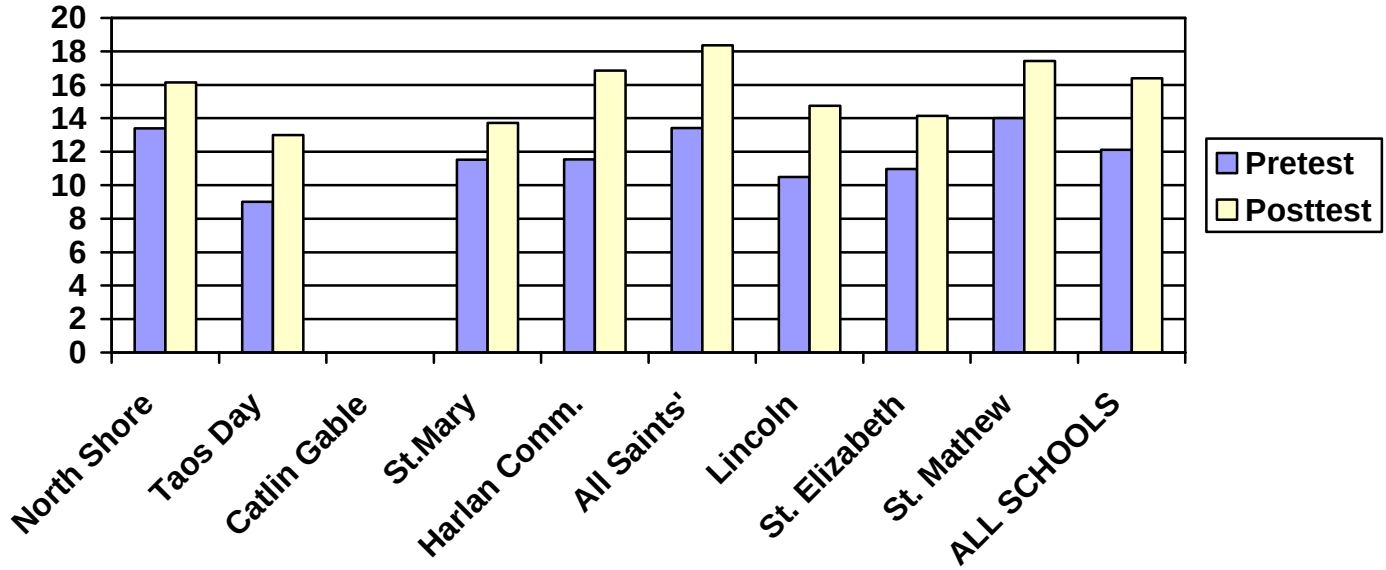
Table 69. Comparisons Between Field Test Sites on Pretest and Posttest results.

Field Test Site	Primary or Secondary Site	SKS1 (Pretest) (Range =0-22)	SKS2 (Posttest) (Range =0-22)	df	t-value
North Shore Christian Middle School	Primary	13.39	16.14	50	7.0**
Taos Day School	Primary	9.0	13.0	10	3.22*
Catlin Gabel	Primary	N/A	N/A	N/A	N/A
St. Mary of the Angels	Primary	11.53	13.73	14	3.56*
Harlan Community Middle School	Primary	11.55	16.85	122	15.89**
All Saints' Episcopal Day School	Primary	13.42	18.36	49	13.06**
Lincoln Multicultural Middle School	Primary	10.50	14.75	11	5.59**
St. Elizabeth Catholic School	Primary	10.97	14.14	28	6.97**
St. Mathew	Secondary	14.0	17.42	18	5.58**
ALL SCHOOLS COMBINED		12.12	16.39	310	22.60**

*=p<.05
**=p<.001

Another way of visualizing the results when comparing the schools is depicted in Table 70. This table shows the results of the pretest for each primary school along with its posttest results.

Table 70. Another Depiction of Pretest and Posttest Scores for Primary and Secondary Site Schools



Discussion of Results

Field Test Demographics.

There inevitably is a conflict between the need for representative samples and the demands of the real world to identify and access willing teachers and students. In field tests, it is logical to identify teachers who are willing, capable, and have the laboratory resources to conduct the tests even though their classes might not yield representative samples. The goal of the evaluation is to test and evaluate new curriculum materials. What better set of subjects to test than those who can use it and articulate its advantages and disadvantages?

The primary field test sites were fairly diverse. They varied in urban-suburban-rural and racial/ethnic composition. Geographically, most areas were represented with the exception of the south east and north east. The secondary site was "opportunistic" in nature, that is, it was included because it applied not because it helped establish "inclusiveness" in any way.

Evaluation Results from Students.

Utility of Student Results for Developers.

In general the results in Tables 6 to 18 are most useful to the developers to obtain the impressions of the students on the different areas of evaluation. The percentage results on all lessons are more dispersed and have more disagreement than the teachers' answers for similar questions. It is suggested that the developers review the separate tables for each lesson and focus on those with the most dispersed and lowest average scores to find room for improvement. For example, Lesson 6: *Shining the Light on Skin* was perceived as the most difficult lesson by teachers and students and Lesson 4: *Helping the Body Build Strong Bones* was the least difficult. Surprisingly, the overall module difficulty rating by students (4.89) was higher than any of the individual lesson difficulty ratings, yet still below the “Just Right” level, indicating that overall, the materials are at or near the right difficulty level for the age group. Reading the comments by the students on these lessons should reveal why they thought this way and give clues to remedies for the materials. Each lesson has a table on the text-based question responses on the lesson difficulty. In addition, lessons 3 and 6 have questions pertaining to the website activities. Comparing the same average of responses to questions across the lessons will give developers an idea of how well the different lessons were evaluated by the students. Evaluation Snapshots in Tables 6-12 also give a quick and brief summary of the lessons and may be a useful starting point.

Comments from Students.

After each of the teacher and student Lesson sections are comments from the students. These include what student’s liked most and least about each lesson. The Most Valuable Aspects of the Module included items such as the web activities, the SunCheck timers and the pasta and rubber band activity. The Least Valuable Aspects of the Module included items such as the too much reading, too easy (and too hard), too much writing and discussion. In the Overall questions, students were asked what suggestions they would make to developers to change the materials. Comments in this section were geared towards, more hands on experiments and multimedia experiences (web, video, etc.). These items are only a sample of the many comments made by students. The developers should review the comments in each section to see the diversity and number of comments and to identify possible areas for change. Additionally, the evaluation snapshots provide a beginning point to understanding the results.

Lesson and Overall Module Difficulty for Students. The results on the level of difficulty judgments by students suggests that even though they are all close to or a little below the *just right* mark that lessons 2 and 3 were perceived as the least difficult and lessons 1 and 6 were perceived to be the most difficult.

Evaluation Results from Teachers.

Utility of Teacher Results for Developers.

Even a brief perusal of the results depicted in the teacher results tables clearly shows that the results from the teachers are less dispersed and focused more in the *agree* range. The average for virtually all the questions was higher than the results for similar questions asked of the students. Again, the task for the developers in examining these tables is to focus on the low scores and most dispersed sets of responses to statements. In so doing, they should identify likely candidates for modifications and improvements in the materials.

Comments from Teachers.

After each of the tables in the chapter sections are comments from the teachers pertaining to that particular lesson (1-7). In the “Overall” results section developers will find comments relating to the overall effectiveness of the materials as well as suggestions for revisions. The Most Valuable Aspects of the Module included items such as the hands on activities, new materials for students, website, incorporating inquiry and SunCheck timers. Least Valuable Aspects of the Module included items such as accessing SunCheck timers, boiling chicken, confusion for students on osteobalsts/clasts. Suggestions for improvements included items such as providing more data for Shining the Light on Skin, make activities more inquiry based, Include SunCheck timers in materials and improve homework suggestions. These items are only a sample of the comments made by teachers. The developers should review the comments in each section to identify candidate areas for changes. The evaluation snapshots contain a brief overview of the lesson and teacher results and is a good place to start.

Comparison of Teacher Ratings on Lessons.

The Snapshot tables contain the results of calculating the averages for the various sets of questions on the different evaluation dimensions. Most of the results are in the *agree* range on these items. However, the developer can identify strong and weak areas of lessons by comparing the lessons to each other, much as the teachers and students did. For instance, both teachers and students rated lesson 6 as the most difficult. It should be noted however, that most of the difficulty score averages from the teachers were near or below the “just right" score of 5 as were those of the students.

Teacher Background Materials.

Questions relating to the teacher background materials can be found in Table 61, with comments relating to the background materials immediately afterward. The teacher background materials scored very high, and there were few complaints about them. The only complaint was that the background materials were a little “wordy”.

Pretest and Posttest Evaluation Results.

The Pretest and Posttest evaluation consists of examination of the differences between the student's scores on a "Student Knowledge Survey". The items were statements which the students could indicate True, False, or Not Sure. Appendix D contains a copy of the pretest and posttest (Student Kowledge Surveys 1 & 2). The students took Student Knowledge Survey 1 (the pretest) before exposure to the materials and Student Knowledge Survey 2 (the posttest) after using the materials. Additionally, analysis of the "Not Sure" responses was conducted as well as the teacher's estimates of the success in achieving learning outcomes. Table 63 contains the student knowledge questions and the percentage of correct responses on the pretest and posttest as well as the reduction of "Not Sure" responses. Tables 64 and 65 are graphic depictions of the pretest and posttest scores. All questions except for one (question 16) showed an increase in student knowledge from pretest to posttest.

The results were uniformly positive. Use of the materials yielded statistically significant increases in knowledge as measured by the student knowledge surveys. Additionally, the teacher estimates of effectiveness in achieving learning outcomes were all in the agree range. The "Not Sure" responses were substantially reduced on the posttest indicating more comfort, familiarity, and correct information from the students.

Conclusions and Recommendations

A. Conclusions

Analysis of the Looking Good, Feeling Good Module clearly shows that the module has been very well crafted and most of the modifications will be of a fine-tuning nature not an overhaul. Student and teachers indicate that Lesson 3 is the most effective lesson while Lesson 6 needs some work. The comments in these lesson sections should be examined by the developers and compared with the results of the site visits by staff in order to obtain most likely areas for improvement to the module.

The evaluation results suggest that the module was very effective overall and yielded statistically significant changes in scores from pretest to posttest results as well as high judgments by teachers of the effectiveness in achieving learning outcomes. Keep up the good work!

B. General Comments Regarding the Looking Good, Feeling Good Module

Lesson Improvements. A reading of this report and the appendices will yield many insights for the developers in ways to improve the materials; of particular interest will be teacher and student comments as well as pre and posttest results. It is clear, however, that the module was successful. Lesson 6 needs improvement, especially in the areas of accessibility to SunCheck timers and data on the website. It was also clear that students and teachers wanted more web activities.

Access by Persons with Disabilities (PWDs). It is recommended that we create curriculum materials, in all their various forms, in ways that allows access by persons with disabilities (PWDs). One of the populations of American society which will benefit greatly from technological advances in computers, CD-ROMs, DVDs, websites and internet access in general are persons with disabilities. The Americans with Disabilities Act (ADA) was passed in 1993 and sets standards and mechanisms for access for PWDs. The Department of Education has a number of agencies working to improve access by PWDs such as the National Institute on Disability and Rehabilitation Research (NIDRR). Also, Congress passed the Workforce Investment Act in 1998 which mandates changes in software and peripheral devices to allow access by PWDs. This Act includes the Rehabilitation Act Amendments of

1998. This Act mandates, in section 508, that when Federal agencies develop, procure, maintain, or use electronic technology, that they ensure it is accessible to PWDs.

We should consider enabling access to our curriculum materials by PWDs and including the cost and time of doing so in our proposals. The modifications are somewhat different for different types of disabilities and often depend on unique technology which the PWD has at their location (such as software on their computer which enlarges text for visually impaired persons). The software for websites can be written in such a fashion as to enable the use of the different input and output devices used by PWDs. Usually, websites are not so constructed. The nonprofit Center for Applied Special Technology (CAST) has procedures to follow to do this and subsequently receive their "Bobby-Approved" status. This approval indicates to the disabled community that certain standards have been met and they will likely have no trouble accessing the site <www.cast.org>. These types of innovations in our curriculum materials, whether stand alone, such as a CD-ROM, or installed and accessible at our website, would make the materials available to a much wider audience.

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Appendix A: Teacher Instructions

NIH6 Curriculum Supplement on Looking Good, Feeling Good: From the Inside Out

Survey Instructions for the Field Test Teachers

1. **Four surveys:**
   - **Student Knowledge Survey 1(Pretest)**
   - **Student Knowledge Survey 2 (Posttest)**
   - **Student Materials Survey**
   - **Teacher Materials Survey**

3. **Student Knowledge Surveys 1 & 2** (1 Pretest & 1 Posttest)
Please administer Student Knowledge Survey 1 (Pretest) prior to teaching any of the materials.
Please administer Student Knowledge Survey 2 (Posttest) after teaching all of the materials.

4. **Student Materials Survey:** Give the Student Survey to your students after they have completed the materials. We suggest that you display an overhead or write on the board descriptions of each lesson to help students remember the lesson. Please feel free to copy these surveys single or double sided.

5. **Teacher Materials Survey:** Please complete your survey on the lessons after you complete each lesson. We have bound your survey for ease of use.

6. **Comments**: Please feel free to make any comments you wish. Your comments are not reported as attributable to you. They are coded and compiled with other comments in order to identify patterns of comments. The more critical input we get at this stage in the development of the materials, the better the final product will be.

7. **Note on Student Survey Identification Numbers:** The *Student Knowledge Surveys* and the *Student Materials Survey* call for the first letter of the last name and the last for digits of the Social Security Number as an identification number for each student. This method does not use the entire SSN. This is the only method approved by the NSF, Department of Education, and the National Institutes of Health as a way of identifying people for research purposes (e.g., linking pretests and posttests) which **guarantees** privacy. This technique has been approved by Institutional Review Boards (IRBs) at major research Universities across the country. Students should have SSNs and should know and use them. A less desirable method **(because it does not guarantee privacy)** can be used if a student does not know or cannot remember their SSN. A student may use portions of their Student ID number (not the number itself) or the last 4 digits of their phone number. It is critical that the number be the same for each survey the student fills out. Please ensure that students know that they must use the same number each time they fill out a survey. For background on this to provide to students or parents, consult the websites on the handout given at the Field Test Orientation.

8. If you have any questions regarding the evaluation portion of the field test please contact either Ted Lamb tlamb@bscs.org or Molly McGarrigle mmcgarrigle@bscs.org (719) 531-5550

Thanks for testing our materials. Field Tests are absolutely essential to developing high quality curriculum materials. Your assistance is greatly appreciated!

Appendix B: Teacher Survey

Teacher Materials Survey

Looking Good, Feeling Good: From the Inside Out

Instructions: Please complete this brief survey **AFTER** you use the supplement materials. This survey will help BSCS improve the quality of these instructional and teacher support materials. Thanks!

1. Name _____ 2. School _____

3. Information about the classes that used the instructional materials:

CLASS	NAME OF CLASS	GRADE LEVEL	NUMBER OF STUDENTS	TYPE OF CLASS (Reg,AP,Honors)	INSTRUCTIONAL SETTING (lab, reg classrm, # of Teachers, aides)
1					
2					
3					
4					
5					

4. Approximate gender composition of all classes:
Male _____%
Female_____%

5. Approximate race/ethnicity composition for all classes: (Note: Categories used by U.S. Census Bureau and reported to the funding agency to assure inclusion of all groups in the study):

Asian_____ %
African American_____%
American Indian or Alaska Native_____%
White_____%
Native Hawaiian or Other Pacific Islander_____%
Some other race/ethnicity (e.g., Hispanic or Latino/Latina)_____%
Two or more races_____%

Lesson 1: *It's Alive! Or Is It?* In this lesson students considered characteristics of living systems and related them to the muscle, skin, and bone systems.

Please rate the materials on the items below.

A. GENERAL QUESTIONS ON LESSON 1: *It's Alive! Or Is It?*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson contained an appropriate amount of content.	1	2	3	4	5	6
2. The lesson promoted thinking, inquiry, and study skills.	1	2	3	4	5	6
3. The lesson was engaging (that is, it got students more interested in the science content).	1	2	3	4	5	6
4. The lesson took an inquiry-oriented approach.	1	2	3	4	5	6

Comments:

B. EFFECTIVENESS OF LESSON 1: *It's Alive! Or Is It?*
MATERIALS IN ACHIEVING LEARNING OUTCOMES

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Students should be able to describe characteristics of living systems.	1	2	3	4	5	6
2. Students should be able to explain characteristics of muscle, skin, and bone that allow these systems to be classified as living.	1	2	3	4	5	6

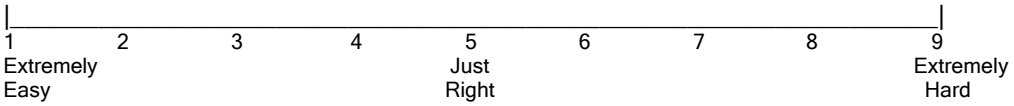
Comments:

C. EFFECTIVENESS OF LESSON 1: *It's Alive! Or Is It?*

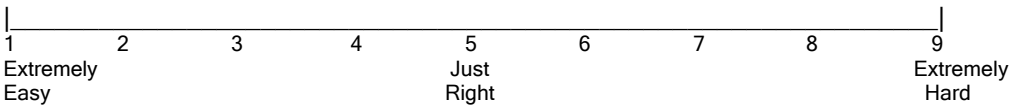
	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Overall, Lesson 1: *It's Alive! Or Is It?* was	1	2	3	4	5	6

Comments:

D. The overall <u>difficulty level of Lesson 1 for students</u> was (circle a number):



E. The overall <u>difficulty level of Lesson 1 for you</u> was (i.e., amount of preparation, delivery, etc.):



F. Other comments on Lesson 1:

G. Total number of class periods used for Lesson 1:_____

Lesson 2: *What Makes Bones Strong?* In this lesson students used pasta and rubber bands to model how minerals and collagen contribute to healthy bones.

Please rate the materials on the items below.

A. GENERAL QUESTIONS ON LESSON 2: *What Makes Bones Strong?*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson contained an appropriate amount of content.	1	2	3	4	5	6
2. The lesson promoted thinking, inquiry, and study skills.	1	2	3	4	5	6
3. The lesson was engaging (that is, it got students more interested in the science content).	1	2	3	4	5	6
4. The lesson took an inquiry-oriented approach.	1	2	3	4	5	6

Comments:

B. EFFECTIVENESS OF LESSON 2: *What Makes Bones Strong?*
MATERIALS IN ACHIEVING LEARNING OUTCOMES

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Students should recognize that there is a relationship between the structure and function of bone.	1	2	3	4	5	6
2. Students should be able to describe how minerals, collagen, and stress affect the strength of bone.	1	2	3	4	5	6

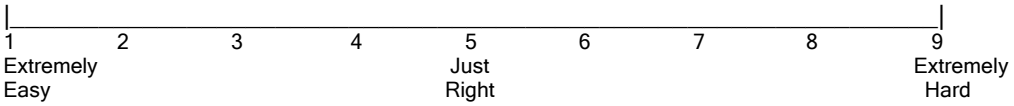
Comments:

C. OVERALL EFFECTIVENESS OF LESSON 2: *What Makes Bones Strong*

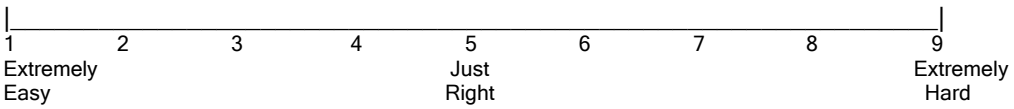
	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Overall, Lesson 1: *What Makes Bones Strong* was	1	2	3	4	5	6

Comments:

D. The overall <u>difficulty level of Lesson 2 for students</u> was (circle a number):



E. The overall <u>difficulty level of Lesson 2 for you</u> was (i.e., amount of preparation, delivery, etc.):



F. Other comments on Lesson 2:

G. Total number of class periods used for Lesson 2:_____

Lesson 3: *Anatomy of a Kick* In this lesson, students investigated how muscles attach to bones and contract to allow someone to kick a ball.

Please rate the materials on the items below.

A. GENERAL QUESTIONS ON LESSON 3: *Anatomy of a Kick*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson contained an appropriate amount of content.	1	2	3	4	5	6
2. The lesson promoted thinking, inquiry, and study skills.	1	2	3	4	5	6
3. The lesson was engaging (that is, it got students more interested in the science content).	1	2	3	4	5	6
4. The lesson took an inquiry-oriented approach.	1	2	3	4	5	6

Comments:

B. EFFECTIVENESS OF LESSON 3: *Anatomy of a Kick*
MATERIALS IN ACHIEVING LEARNING OUTCOMES

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Students should be able to explain that muscles produce movement by contracting.	1	2	3	4	5	6
2. Students should be able to explain that muscles are attached to bones.	1	2	3	4	5	6
3. Students should be able to explain that opposing muscles or groups of muscles produce movement in opposing directions.	1	2	3	4	5	6

Comments:

C. WEBSITE FOR LESSON 3: *Anatomy of a Kick*

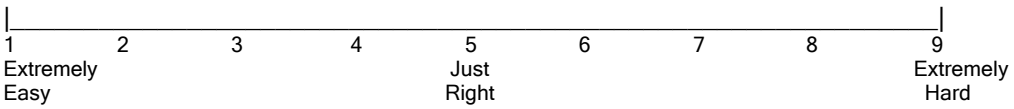
	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The students were able to navigate easily through the website without confusion.	1	2	3	4	5	6
2. The website aided in comprehension of the lesson.	1	2	3	4	5	6
3. The website made the lesson interesting for students.	1	2	3	4	5	6

D. EFFECTIVENESS OF LESSON 3: *Anatomy of a Kick*

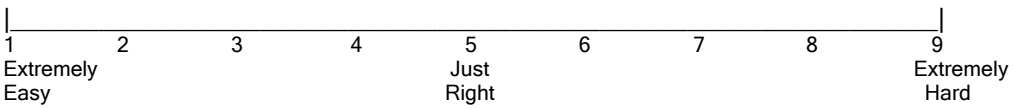
	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Overall, Lesson 3: *Anatomy of a Kick* was	1	2	3	4	5	6

Comments:

E. The overall <u>difficulty level of Lesson 3 for students</u> was (circle a number):



F. The overall <u>difficulty level of Lesson 3 for you</u> was (i.e., amount of preparation, delivery, etc.):



G. Other comments on Lesson 3 (use back if necessary).

H. Total number of class periods used for Lesson 3:_____

Lesson 4: *Helping the Body to Build Strong Bones* In this lesson students analyzed how diet and weight-bearing exercise contribute to bone mineral content.

Please rate the materials on the items below.

A. GENERAL QUESTIONS ON LESSON 4: *Helping the Body to Build Strong Bones*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson contained an appropriate amount of content.	1	2	3	4	5	6
2. The lesson promoted thinking, inquiry, and study skills.	1	2	3	4	5	6
3. The lesson was engaging (that is, it got students more interested in the science content).	1	2	3	4	5	6
4. The lesson took an inquiry-oriented approach.	1	2	3	4	5	6

Comments:

B. EFFECTIVENESS OF LESSON 4: *Helping the Body to Build Strong Bones* MATERIALS IN ACHIEVING LEARNING OUTCOMES

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Students should be able to recognize the importance of diet and weight-bearing activities to the strength and health of their bones.	1	2	3	4	5	6
2. Students should be able to analyze data tables to make evidence-based conclusions.	1	2	3	4	5	6
3. Students should appreciate that more minerals, especially calcium, in bones makes them stronger.	1	2	3	4	5	6
4. Students should understand that different types of weight-bearing activities produce different effects on the skeleton.	1	2	3	4	5	6

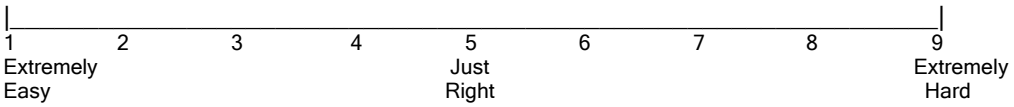
Comments:

C. EFFECTIVENESS OF LESSON 4: *Helping the Body to Build Strong Bones*

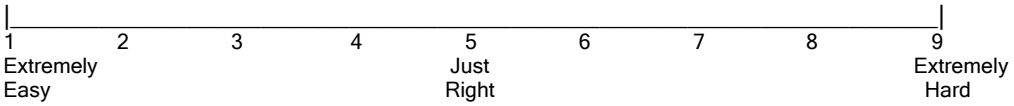
	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Overall, Lesson 4: *Helping the Body to Build Strong Bones* was	1	2	3	4	5	6

Comments:

D. The overall <u>difficulty level of Lesson 4 for students</u> was (circle a number):



E. The overall <u>difficulty level of Lesson 4 for you</u> was (i.e., amount of preparation, delivery, etc.):



F. Other comments on Lesson 4 (use back if necessary).

G. Total number of class periods used for Lesson 4:_____

Lesson 5: Use It or Lose It

This lesson used rats as a model system to investigate how resistance training influences muscle mass.

Please rate the materials on the items below.

A. GENERAL QUESTIONS ON LESSON 5: *Use It or Lose It*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson contained an appropriate amount of content.	1	2	3	4	5	6
2. The lesson promoted thinking, inquiry, and study skills.	1	2	3	4	5	6
3. The lesson was engaging (that is, it got students more interested in the science content).	1	2	3	4	5	6
4. The lesson took an inquiry-oriented approach.	1	2	3	4	5	6

Comments:

B. EFFECTIVENESS OF LESSON 5: *Use It or Lose It*
MATERIALS IN ACHIEVING LEARNING OUTCOMES

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Students should be able to describe how resistance training influences muscle.	1	2	3	4	5	6
2. Students should be able to recognize that animals such as rats are used as model systems in research.	1	2	3	4	5	6
3. Students should be able to us mathematics to organize and present data.	1	2	3	4	5	6

Comments:

C. EFFECTIVENESS OF LESSON 5: *Use It or Lose It*

	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Overall, Lesson 5: *Use It or Lose It* was	1	2	3	4	5	6

Comments:

D. The overall <u>difficulty level of Lesson 5 for students</u> was (circle a number):

|_____|
1 2 3 4 5 6 7 8 9
Extremely Easy — Just Right — Extremely Hard

E. The overall <u>difficulty level of Lesson 5 for you</u> was (i.e., amount of preparation, delivery, etc.):

|_____|
1 2 3 4 5 6 7 8 9
Extremely Easy — Just Right — Extremely Hard

F. Other comments on Lesson 5 (use back if necessary).

G. Total number of class periods used for Lesson 5:_____

Lesson 6: *Shining the Light on Skin* in this lesson, students used SunCheck Timers to study how the environment influences safe levels of exposure to sunlight.

Please rate the materials on the items below.

A. GENERAL QUESTIONS ON LESSON 6: *Shining the Light on Skin*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson contained an appropriate amount of content.	1	2	3	4	5	6
2. The lesson promoted thinking, inquiry, and study skills.	1	2	3	4	5	6
3. The lesson was engaging (that is, it got students more interested in the science content).	1	2	3	4	5	6
4. The lesson took an inquiry-oriented approach.	1	2	3	4	5	6

Comments:

B. EFFECTIVENESS OF LESSON 6: *Shining the Light on Skin*
MATERIALS IN ACHIEVING LEARNING OUTCOMES

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Students should be able use SunCheck Timers to estimate when they have received the maximum daily safe exposure to sunlight.	1	2	3	4	5	6
2. Students should be able to formulate a testable question about exposure to sunlight and conduct an investigation.	1	2	3	4	5	6
3. Students should be able to analyze and interpret data tables.	1	2	3	4	5	6
4. Students should be able to assess the effectiveness of various types of sun protection.	1	2	4	3	5	6

Comments:

C. WEBSITE FOR LESSON 6: *Shining the Light on Skin*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The students were able to navigate easily through the website without confusion.	1	2	3	4	5	6
2. The website aided in comprehension of the lesson.	1	2	3	4	5	6
3. The website made the lesson interesting for students.	1	2	3	4	5	6

D. EFFECTIVENESS OF LESSON 6: *Shining the Light on Skin*

	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Overall, Lesson 3: *Anatomy of a Kick* was	1	2	3	4	5	6

Comments:

E. The overall <u>difficulty level of Lesson 6 for students</u> was (circle a number):

|_____|
1 2 3 4 5 6 7 8 9
Extremely Easy — Just Right — Extremely Hard

F. The overall <u>difficulty level of Lesson 6 for you</u> was (i.e., amount of preparation, delivery, etc.):

|_____|
1 2 3 4 5 6 7 8 9
Extremely Easy — Just Right — Extremely Hard

G. Other comments on Lesson 6 (use back if necessary).

H. Total number of class periods used for Lesson 6:_____

Lesson 7: *Decisions Today for a Healthy Tomorrow* In this lesson, students communicated what they learned about the muscle, skin, and bone systems as part of a community health fair.

Please rate the materials on the items below.

A. GENERAL QUESTIONS ON LESSON 7: *Decisions Today for a Healthy Tomorrow*

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson contained an appropriate amount of content.	1	2	3	4	5	6
2. The lesson promoted thinking, inquiry, and study skills.	1	2	3	4	5	6
3. The lesson was engaging (that is, it got students more interested in the science content).	1	2	3	4	5	6
4. The lesson took an inquiry-oriented approach.	1	2	3	4	5	6

Comments:

B. EFFECTIVENESS OF LESSON 7: *Decisions Today for a Healthy Tomorrow* MATERIALS IN ACHIEVING LEARNING OUTCOMES

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. Students should be able to appreciate the roles of living cells in the muscle, skin, and bone systems.	1	2	3	4	5	6
2. Students should be able to recognize relationships among the structure and function of the muscle, skin, and bone systems.	1	2	3	4	5	6
3. Students should be able to explain how muscle and bone interact to produce movement.	1	2	3	4	5	6
4. Students should be able to describe how lifestyle choices can influence the health of the muscle, skin, and bone systems.	1	2	3	4	5	6

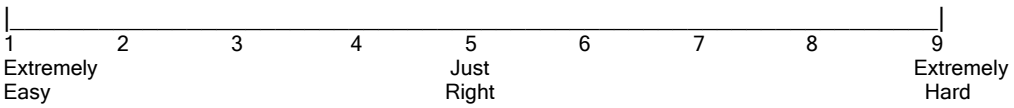
Comments:

C. EFFECTIVENESS OF LESSON 7: *Decisions Today for a Healthy Tomorrow*

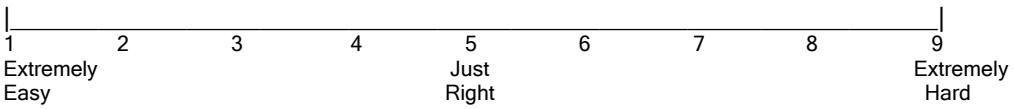
	Very Ineffective	Ineffective	Moderately Ineffective	Moderately Effective	Effective	Very Effective
1. Overall, Lesson 3: *Anatomy of a Kick* was	1	2	3	4	5	6

Comments:

D. The overall <u>difficulty level of Lesson 7 for students</u> was (circle a number):



E. The overall <u>difficulty level of Lesson 7 for you</u> was (i.e., amount of preparation, delivery, etc.):



F. Other comments on Lesson 7 (use back if necessary):

G. Total number of class periods used for Lesson 7:_____

GENERAL QUESTIONS ABOUT THE CURRICULUM SUPPLEMENT

Please rate the material on the items below.

A. CONTENT

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The content was a valuable addition to my curriculum.	1	2	3	4	5	6
2. The examples and explanations were appropriate for my students.	1	2	3	4	5	6
3. The amount of prerequisite knowledge required to understand the lesson was acceptable.	1	2	3	4	5	6
4. Students could understand the scientific content clearly.	1	2	3	4	5	6
5. The supplement could replace some lessons in my current curriculum.	1	2	3	4	5	6
6. The content was related to real-life examples and/or students' lives.	1	2	3	4	5	6

Comments:

B. GRAPHICS (PHOTOS, CLIP ART, ILLUSTRATIONS, TABLES, MAPS, GRAPHS, ETC.) in the Masters

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The graphics were clear and meaningful.	1	2	3	4	5	6
2. The graphics helped students understand the material.	1	2	3	4	5	6
3. The graphics promoted student thinking, discussion, problem solving, and inquiry.	1	2	3	4	5	6
4. The graphics were engaging (that is, they got students doing interesting things).	1	2	3	4	5	6

Comments:

C. WEBSITE

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The students were able to navigate easily in the website without confusion.	1	2	3	4	5	6
2. The website made the major concepts more understandable.	1	2	3	4	5	6
3. The website made the lessons more interesting.	1	2	3	4	5	6

Comments:

D. TEACHER BACKGROUND MATERIALS

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The teacher's background materials helped me understand and support the lessons.	1	2	3	4	5	6
2. The implementation materials helped me teach the activities.	1	2	3	4	5	6
3. The relationship between *NSES*'s content standards and lesson-specific concepts were clearly presented in the teacher background materials.	1	2	3	4	5	6

Comments:

E. OPEN-ENDED QUESTIONS:

1. Describe how you used the materials:

2. Any other relevant information about how you used the materials:

3. What were the three <u>most</u> valuable aspects of the materials and why?

4. What were the three least valuable aspects of the materials and why?

5. Please provide two recommendations to improve these materials.

Thanks for your help!

Appendix C: Student Survey

Student Materials Survey

Looking Good, Feeling Good: From the Inside Out

Instructions: Please complete these brief questions on each lesson in the Curriculum Supplement. This survey will help your teachers and the project developers make this a better science unit. Feel free to make comments in any section. Thanks!

Your Identification Number for the study:_____
(The 1st initial of your last name and the last 4 digits of your social security number, for example, Rosita McGillicuty, SSN=123-45-6789 would be: M6789). **OR**, whatever other identification method you and your teacher are using to identify the questionnaires and assure your anonymity and confidentiality.

Demographic Information:
(reported to the funding agency, the National Institutes of Health, to assure inclusion of all groups in the study)

1. Gender:
_____Female ____Male

2. Race/Ethnicity (check one) **(categories used by U.S. Census Bureau):**
_____Asian _____African American _____American Indian or Alaska Native _____White
_____Native Hawaiian or Other Pacific Islander _____Some other race/ethnicity (e.g., Hispanic or Latino/Latina)
_____Two or more races

3. What is your grade level in school?

_____6th _____7th _____8th

4. Are you on the free lunch or reduced lunch program?

_____Yes _____No

Please circle a number to indicate your level of agreement with these statements.

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
4. I am interested in science, in general.	1	2	3	4	5	6
5. I am very interested in Biology.	1	2	3	4	5	6
6. I am good at science, in general.	1	2	3	4	5	6

Comments on any of the above:

Lesson 1: *It's Alive! Or Is It?* In this lesson you considered characteristics of living systems and related them to the muscle, skin and bone systems.

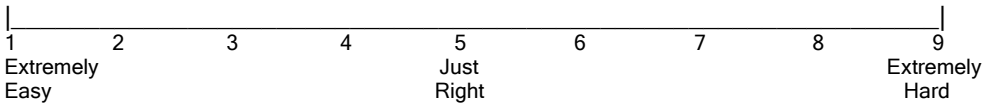
A. THE STUDENT MATERIALS

Please rate the materials you used on the items below. Circle a number.

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson was interesting.	1	2	3	4	5	6
2. I could read the material easily.	1	2	3	4	5	6
3. I could understand the examples and explanations.	1	2	3	4	5	6
4. The lesson made me think about new things and questions.	1	2	3	4	5	6
5. I could understand the scientific information easily.	1	2	3	4	5	6

Comments on any of the above:

B. The difficulty level of Lesson 1 *It's Alive! Or Is It?* was: (circle a number)



C. What did you like most about this lesson?

D. What did you like least about this lesson?

Lesson 2: *What Makes Bones Strong?* In this lesson you used pasta and rubber bands to model how minerals and collagen contribute to healthy bones.

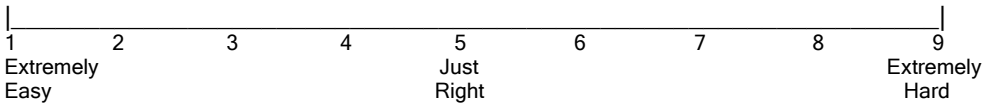
A. THE STUDENT MATERIALS

Please rate the materials you used on the items below. Circle a number.

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson was interesting.	1	2	3	4	5	6
2. I could read the material easily.	1	2	3	4	5	6
3. I could understand the examples and explanations.	1	2	3	4	5	6
4. The lesson made me think about new things and questions.	1	2	3	4	5	6
5. I could understand the scientific information easily.	1	2	3	4	5	6

Comments on any of the above:

B. The difficulty level of Lesson 2: *What Makes Bones Strong* was: (circle a number)



C. What did you like most about this lesson?

D. What did you like least about this lesson?

Lesson 3: *Anatomy of a Kick* In this lesson, you investigated how muscles attach to bones and contract to allow someone to kick a ball.

A. THE STUDENT MATERIALS

Please rate the materials you used on the items below. Circle a number.

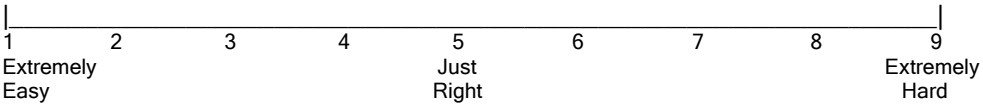
	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson was interesting.	1	2	3	4	5	6
2. I could read the material easily.	1	2	3	4	5	6
3. I could understand the examples and explanations.	1	2	3	4	5	6
4. The lesson made me think about new things and questions.	1	2	3	4	5	6
5. I could understand the scientific information easily.	1	2	3	4	5	6

B. WEBSITE

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. I was able to navigate easily in the website without confusion.	1	2	3	4	5	6
2. The website helped me understand how to conduct scientific investigations.	1	2	3	4	5	6
3. The website made the lesson more interesting	1	2	3	4	5	6

Comments on any of the above:

C. The difficulty level of Lesson 3: *Anatomy of a Kick* was: (circle a number)



D. What did you like most about this lesson?

E. What did you like least about this lesson?

Lesson 4: *Helping the Body to Build Strong Bones* in this lesson you analyzed how diet and weight-bearing exercise contribute to bone mineral content.

A. THE STUDENT MATERIALS

Please rate the materials you used on the items below. Circle a number.

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson was interesting.	1	2	3	4	5	6
2. I could read the material easily.	1	2	3	4	5	6
3. I could understand the examples and explanations.	1	2	3	4	5	6
4. The lesson made me think about new things and questions.	1	2	3	4	5	6
5. I could understand the scientific information easily.	1	2	3	4	5	6

Comments on any of the above:

B. The difficulty level of Lesson 4: *Helping the Body to Build Strong Bones* was:

(circle a number)

|_____|

1 2 3 4 5 6 7 8 9

Extremely Easy — Just Right — Extremely Hard

C. What did you like most about this lesson?

D. What did you like least about this lesson?

Lesson 5: *Use It or Lose It* This lesson used rats as a model system to investigate how resistance training influences muscle mass.

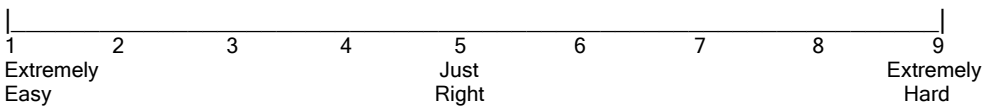
A. THE STUDENT MATERIALS

Please rate the materials you used on the items below. Circle a number.

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson was interesting.	1	2	3	4	5	6
2. I could read the material easily.	1	2	3	4	5	6
3. I could understand the examples and explanations.	1	2	3	4	5	6
4. The lesson made me think about new things and questions.	1	2	3	4	5	6
5. I could understand the scientific information easily.	1	2	3	4	5	6

Comments on any of the above:

B. The difficulty level of Lesson 5: *Use It or Lose It* was: (circle a number)



C. What did you like most about this lesson?

D. What did you like least about this lesson?

Lesson 6: *Shining the Light on Skin* In this lesson, you used SunCheck Timers to study how the environment influences safe levels of exposure to sunlight.

A. THE STUDENT MATERIALS

Please rate the materials you used on the items below. Circle a number.

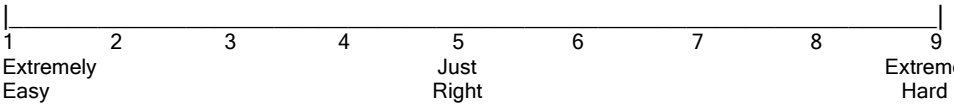
	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson was interesting.	1	2	3	4	5	6
2. I could read the material easily.	1	2	3	4	5	6
3. I could understand the examples and explanations.	1	2	3	4	5	6
4. The lesson made me think about new things and questions.	1	2	3	4	5	6
5. I could understand the scientific information easily.	1	2	3	4	5	6

B. WEBSITE

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. I was able to navigate easily in the website without confusion.	1	2	3	4	5	6
2. The website helped me understand how to conduct scientific investigations.	1	2	3	4	5	6
3. The website made the lesson more interesting	1	2	3	4	5	6

Comments on any of the above:

C. The difficulty level of Lesson 6: *Shining the Light on Skin was*: (circle a number)



D. What did you like most about this lesson?

E. What did you like least about this lesson?

Lesson 7: *Decisions Today for a Healthy Tomorrow* In this lesson, you communicated what you learned about the muscle, skin and bone systems as part of a community health fair.

A. THE STUDENT MATERIALS

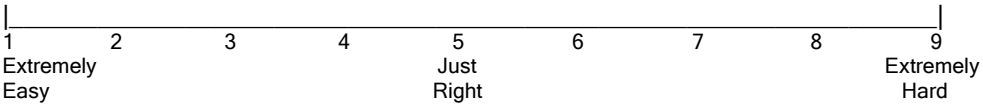
Please rate the materials you used on the items below. Circle a number.

	Strongly Disagree	Disagree	Disagree a Little	Agree a Little	Agree	Strongly Agree
1. The lesson was interesting.	1	2	3	4	5	6
2. I could read the material easily.	1	2	3	4	5	6
3. I could understand the examples and explanations.	1	2	3	4	5	6
4. The lesson made me think about new things and questions.	1	2	3	4	5	6
5. I could understand the scientific information easily.	1	2	3	4	5	6

Comments on any of the above:

B. The difficulty level of Lesson 7: *Decisions Today for a Healthy Tomorrow was*:

(circle a number)

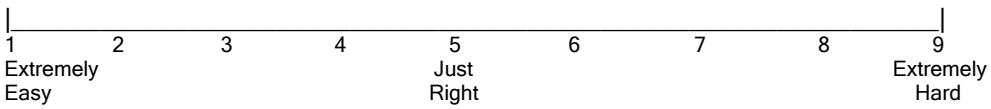


C. What did you like most about this lesson?

D. What did you like least about this lesson?

Please complete these OVERALL questions about the supplement .

Overall, the difficulty level of the Lessons and activities was: (circle a number)



Overall, what three things did you like most about the supplement and why?

Overall, what three things did you like least about the supplement and why?

What specific suggestions would you make to the developers to improve these materials?

Thanks for your help!

Appendix D: Student Knowledge Surveys

CENTER FOR Research & Evaluation

BSCS

Student Knowledge SURVEY #1

Looking Good, Feeling Good: From the Inside Out

Your indentification number: _____ (The first initial of your last name and the last 4 digits of your social security number (for example, Rodita McGillicuty, SSN - 123 45 6789 would be M6789).

Circle the correct answer.

1. Living things are made of cells.	True	False	Not Sure
2. Your bones are alive	True	False	Not Sure
3. Living things can be distinguished from a nonliving thing.	True	False	Not Sure
4. Your bones do not contain living cells.	True	False	Not Sure
5. Collagen is a protein that helps give bone its structure.	True	False	Not Sure
6. The mineral content of bone cannot be changed by diet or exercise.	True	False	Not Sure
7. Tendons attach muscle to bone.	True	False	Not Sure
8. Muscles push and pull bones by lengthening and shortening.	True	False	Not Sure
9. It takes a pair of muscles to flex and extend at a joint.	True	False	Not Sure
10. Bones are affected by exercise, but not by diet.	True	False	Not Sure
11. Exercise can help bones add minerals and become stronger.	True	False	Not Sure

12. Jumping is better than swimming for building strong bones.	True	False	Not Sure
13. Placing weight on bones during exercise weakens them.	True	False	Not Sure
14. The effects of exercise on muscles last a lifetime.	True	False	Not Sure
15. Muscles strength increases with mass.	True	False	Not Sure
16. People with dark skin do not have to worry about getting too much sun.	True	False	Not Sure
17. A tan indicates healthy skin.	True	False	Not Sure
18. The portion of sunlight that causes sunburn is called infrared.	True	False	Not Sure
19. The intensity of sunlight at noon varies with the time of year.	True	False	Not Sure
20. Minerals such as calcium and phosphorous are important to the health of bone.	True	False	Not Sure
21. Inactivity causes muscles to lose size and strength.	True	False	Not Sure
22. You need muscles and bones to move one of your limbs.	True	False	Not Sure

CENTER FOR Research & Evaluation

BSCS

Student Knowledge SURVEY #2

Looking Good, Feeling Good: From the Inside Out

Your indentification number: _____ (The first initial of your last name and the last 4 digits of your social security number (for example, Rodita McGillicuty, SSN - 123 45 6789 would be M6789).

Circle the correct answer.

1. Living things are made of cells.	True	False	Not Sure
2. Your bones are alive	True	False	Not Sure
3. Living things can be distinguished from a nonliving thing.	True	False	Not Sure
4. Your bones do not contain living cells.	True	False	Not Sure
5. Collagen is a protein that helps give bone its structure.	True	False	Not Sure
6. The mineral content of bone cannot be changed by diet or exercise.	True	False	Not Sure
7. Tendons attach muscle to bone.	True	False	Not Sure
8. Muscles push and pull bones by lengthening and shortening.	True	False	Not Sure
9. It takes a pair of muscles to flex and extend at a joint.	True	False	Not Sure
10. Bones are affected by exercise, but not by diet.	True	False	Not Sure
11. Exercise can help bones add minerals and become stronger.	True	False	Not Sure

12. Jumping is better than swimming for building strong bones.	True	False	Not Sure
13. Placing weight on bones during exercise weakens them.	True	False	Not Sure
14. The effects of exercise on muscles last a lifetime.	True	False	Not Sure
15. Muscles strength increases with mass.	True	False	Not Sure
16. People with dark skin do not have to worry about getting too much sun.	True	False	Not Sure
17. A tan indicates healthy skin.	True	False	Not Sure
18. The portion of sunlight that causes sunburn is called infrared.	True	False	Not Sure
19. The intensity of sunlight at noon varies with the time of year.	True	False	Not Sure
20. Minerals such as calcium and phosphorous are important to the health of bone.	True	False	Not Sure
21. Inactivity causes muscles to lose size and strength.	True	False	Not Sure
22. You need muscles and bones to move one of your limbs.	True	False	Not Sure